Gates Learjet 35A/36A
with
FC-530 Autopilot

FAA APPROVED AIRPLANE FLIGHT MANUAL

THIS AIRPLANE MUST BE OPERATED IN COMPLIANCE WITH THE PRESCRIBED LIMITATIONS IN SECTION 1 OF THIS MANUAL

NOTICE

This AFM is a revised issue of the original AFM dated 9-20-82. This reissue replaces all of the information in the original issue.

SERIAL NO. ____________________

N ____________________

FAA APPROVED E. L. Bollin **DATE** 5/13/83

for MANAGER, WICHITA AIRCRAFT CERTIFICATION OFFICE
FAA CENTRAL REGION
WICHITA, KANSAS

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FM-108

HIGHLIGHTS

The following summary describes the changes that are incorporated with this change.

LIMITATIONS

SYSTEM LIMITS	Arranged limits (by system) in alphabetical order. The limits themselves are not changed.
Fuel Additives — Biocide Additive	Incorporated TFM 2012-04 (Revised limitation to clarify that biocide fuel additive is not a requirement; however, there are several products that may be used. Refer to the fuel servicing addendum.)

NORMAL PROCEDURES

Exterior Preflight	Emphasized the need to check the engine oil dipstick filler cap for security.
Before Starting Engines	Stall Warning System Check — Moved the NOTE (L or R STALL warning light) to the end of the check. Autopilot Monitor Check — Reference to "ess B bus" is not correct for all aircraft. Some aircraft do not have the split essential bus (i.e., ESS A and ESS B bus).
Quick Turnaround	Concluded the quick turnaround procedure with "Taxi and Before Takeoff" steps. Go to the normal RUNWAY LINEUP procedure for continuation.
TAXI and BEFORE TAKEOFF	Revised to match title of normal (non-quick turn) procedure. Was "TAXI".
Cold Weather Operation	Engine Start — Changed NOTE to CAUTION (failure to comply with the guidance could cause serious engine damage).

EMERGENCY PROCEDURES

Dual Generator Failure	Adds caution to prevent electrical system damage because of misuse of GEN RESET function. The caution is applicable to two steps within the procedure.
Overspeed Warning Horn Activates	Restructured to minimize the immediate action items.
Pitch Axis Malfunction	Formatting changes only: - Removed bold emphasis from NOTEs within immediate action items. - Added bold emphasis to identify steps associated with isolating a pitch trim system malfunction.

ABNORMAL PROCEDURES

Introduction to Abnormal Procedures	Removed description of immediate action (memory) items. There are no immediate action items in the Abnormal Procedures section.
Inadvertent Icing Encounter	Updated cross references — Changed "… LANDINGS…" to "… WING AND STAB HEAT FAILURE — LANDING…" (2 places).
Stabilizer Heat Failure	Updated cross reference — Changed "… LANDINGS…" to "… STABILIZER HEAT FAILURE — LANDING…".
STAB OV HT Light Illuminated	Updated cross reference — Changed "… LANDINGS…" to "… WING AND STAB HEAT FAILURE — LANDING…".
Wing Heat Failure	Updated cross reference — Changed "… LANDINGS…" to "… WING HEAT FAILURE — LANDING…".
WING OV HT Light Illuminated	Updated cross reference — Changed "… LANDINGS…" to "… WING AND STAB HEAT FAILURE — LANDING…".
Single Generator Failure	Adds caution to prevent electrical system damage because of misuse of GEN RESET function. The caution is applicable to two steps within the procedure.
Abnormal Engine Operation	Updated cross reference — Changed "Follow the appropriate sections of…" to "Refer to…".
Cabin Auxiliary Heater Fails On	Incorporated TFM 2013-01 (Adds new procedure to address a cabin auxiliary heater that does not shut off normally).
AUG AIL Light Illuminated	Incorporated TFM 2011-03 (Adds warning relating to the resetting of the spoileron computer).
Stall Warning System Failure	Changed presentation of procedure — Divided procedure into "Single" and "Dual" System Failures. New steps added to switch the affected system OFF.
LOW FUEL Light Illuminated	Updated cross reference — Changed "… FUEL CROSSFLOW…" to "… FUEL CROSSFLOW (WING-TO-WING FUEL TRANSFER)…".
Normal Fuel Transfer System Failure — Aircraft without FUS VALVE switch	Incorporated TFM 2013-06 (Changes title of procedure to better describe conditions when procedure is applicable).
Tip Tank Fails to Transfer Fuel	Formatting change only — Hyphenated "one-half".

LO HYD Light Illuminated	Updated cross reference — Changed "… HYDRAULIC SYSTEM FAILURE — LANDING…" to "… HYDRAULIC SYSTEM FAILURE LANDING…".
Pitot-Static System Malfunction	Corrected the nomenclature to reflect labeling on the circuit breaker panel.
Gear Up Landing	Updated cross reference — Changed "…ANTI-SKID OFF OPERATION…" to "…ANTI-SKID GEN LIGHT ILLUMINATED — ANTI-SKID OFF OPERATION…".
Hydraulic System Failure Landing	Incorporated TFM 2012-01 (Restricts flap deflection to 20°).
Partial Flap Landing	Updated cross reference — Changed "… HYDRAULIC SYSTEM FAILURE — LANDING…" to "… HYDRAULIC SYSTEM FAILURE LANDING…".
Operation with One Fuel Computer Inoperative	Updated cross reference — Changed to read "… STARTER ENGAGED LIGHT REMAINS ILLUMINATED AFTER START…".
TAXI and BEFORE TAKEOFF	Revised to match title of normal procedure. Was "TAXI".
APPROACH	Changed "...Approach checklist" to "...APPROACH checklist".
Operation with Nose Wheel Steering Inoperative	Added anti-skid system as a proviso for use of this procedure. Required per MMEL.
TAXI and BEFORE TAKEOFF	Revised to match title of normal procedure. Was "TAXI".

PERFORMANCE DATA

Figure 5-19 (Page 5-30)	Corrected page status. Some books are printed with "Change 13" status. The correct status of this page is "Change 3".

LOG OF TEMPORARY FLIGHT MANUAL CHANGES

This list is intended to assist the flight crew in determining the applicable AFM temporary flight manual changes for Model 35A/36A aircraft equipped with FC-530 autopilot. It is the responsibility of the aircraft owner and operator to maintain their basic AFM with the temporary changes applicable to their aircraft. Insert this list before page A.

TFM # Dated	Section or Page	Description	Status
84-02 3-15-84	1-2	Maximum zero wing and tip fuel weight replaces maximum wing bending weight.	Removed by Chg 3.
85-02 3-8-85	IV	Revised FUEL CMPTR light procedure.	Removed by Chg 5.
85-10 1-3-86	2-2	Engine oil and hydraulic accumulator preflight checks.	Removed by Chg 7.
87-05 3-2-87	4-18	Clarify operation of emergency gear extension valve.	Removed by Chg 8.
87-06 3-2-87	4-20	Clarify operation of emergency gear extension valve.	Removed by Chg 8.
87-15 7-16-87	II	Bleed hydraulic pressure to zero before setting battery switches off.	Superseded by TFM 88-17.
88-01 2-12-88	1-1	Prohibits operation in IMC and icing. (Aircraft 35-623 and 35-635 only)	Active, until all weather certification received.
88-10 2-13-89	4-31	Pitot-static system malfunction procedure.	Removed by Chg 10.
88-17 1-17-89	II	Bleed hydraulic pressure to zero before setting battery switches off.	Removed by Chg 13.
89-17 11-16-89	4-16	Fuel imbalance during fuel transfer procedure.	Removed by Chg 12.
90-11 12-4-90	2-60	Procedures for revised windshield defog system.	Removed by Chg 13.
92-02 9-10-92	2-20	Clarify the oil pressure annunciator.	Removed by Chg 16.
94-15 1-9-95	1-14	Maximum operating altitude — 41,000 FT. (Aircraft 35-646 and subsequent; 36-059 and subsequent. Also, prior aircraft when cabin outflow or safety valve has been replaced between 1-1-89 and 1-9-95)	Active, until SB 35/36-21-19 is accomplished.
94-23 3-6-95	5-8	Revised noise level compliance statement.	Removed by Chg 18.
96-08 5-30-96	2-49	Standby fuel pump annunciators.	Removed by Chg 18.
96-09 5-30-96	4-17	Procedure for standby fuel pump failing to shut off.	Removed by Chg 18.

Continued

TFM # Dated	Section or Page	Description	Status
96-10 7-12-96	1-12	Adds paved runway restriction to limitations section.	Removed by Chg 18.
99-02 7-16-99	1-15	Revises the list of approved oils.	Superseded by TFM 99-24.
99-03 4-16-99	1-17	Revises fuel anti-icing additive limitations.	Removed by Chg 20.
99-24 11-30-99	1-15	Revises the list of approved oils.	Superseded by TFM 99-26.
99-26 12-21-99	1-15	Revises the list of approved oils.	Removed by Chg 20.
2001-15 4-13-01	4-45	Revises Single Engine Landing procedure.	Removed by Chg 21.
2007-02 6-14-07	3-46	Revises Stall Warning Activates procedure.	Removed by Chg 22.
2007-04 6-14-07	4-28	Revises AUG AIL Light Illuminated procedure.	Removed by Chg 22.
2007-13 1-14-08	4-10	Revises Single Generator Failure procedure.	Removed by Chg 22.
2007-14 1-14-08	3-8	Revises Dual Generator Failure procedure.	Removed by Chg 22.
2011-03 10-24-11	4-28	AUG AIL Light — Warning to reset spoileron computer only in level stabilized flight above 1000 feet AGL.	Removed by Chg 23.
2012-01 7-9-12	4-43	Hydraulic System Failure Landing — Max flaps = 20°.	Removed by Chg 23.
2012-04 8-22-12	1-17	BIOCIDE Fuel Additive — Specifies that biocide is not a requirement.	Removed by Chg 23.
2013-01 3-11-13	4-17	Adds “Cabin Auxiliary Heater Fails ON” procedure.	Removed by Chg 23.
2013-06 1-13-14	4-34	Normal Fuel Transfer System Failure — Clarifies indications seen in the cockpit.	Removed by Chg 23.

LIST OF EFFECTIVE PAGES

Use this List of Effective Pages to determine the current status of the Airplane Flight Manual. Pages affected by the current change are indicated by an asterisk (*) immediately preceding the page number.

Learjet 35A/36A with FC-530 Autopilot AFM

Dates of issue for Original and Changed pages are:

Original	O	9-20-1982
Reissued		5-13-1983
Change	1	6-2-1983
Change	2	2-22-1984
Change	3	9-19-1984
Change	4	2-15-1985
Change	5	5-31-1985
Change	6	8-13-1985
Change	7	11-10-1986
Change	8	11-17-1988
Change	9	6-12-1989
Change	10	7-5-1989
Change	11	12-29-1989
Change	12	3-29-1990
Change	13	1-13-1992
Change	14	1-24-1992
Change	15	6-8-1992
Change	16	9-23-1992
Change	17	11-15-1993
Change	18	3-14-1997
Change	19	11-18-1998
Change	20	12-1-2000
Change	21	9-5-2006
Change	22	6-23-2008
Change	23	1-25-2017

NOTE

- This change supersedes and incorporates TFM 2011-03, TFM 2012-01, TFM 2012-04, TFM 2013-01, and TFM 2013-06. Remove superseded temporary changes from AFM.
- Pages 4-49, 4-50 and 4-51 are deleted by this change.

Page	Change
Title	8
*A thru C	23
i	18
ii	Reissued
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FAA Approved Tina J. Miller **Date** 1/25/2017

for MARGARET KLINE, MANAGER
AIRCRAFT CERTIFICATION OFFICE
FEDERAL AVIATION ADMINISTRATION
WICHITA, KANSAS

LIST OF EFFECTIVE PAGES (Cont)

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INTRODUCTION

THIS AIRPLANE FLIGHT MANUAL MUST BE CARRIED IN THE AIRCRAFT AT ALL TIMES.

THE MANUAL

This manual is divided into seven basic sections as follows:

Section I — LIMITATIONS containing FAA approved operating limitations which must be observed, except where a deviation is specifically authorized, during operation of the aircraft.

Section II — NORMAL PROCEDURES containing FAA approved operation procedures for the aircraft and its systems which may be considered routine in day-to-day operations.

Section III — EMERGENCY PROCEDURES containing FAA approved operating procedures requiring the use of special system and/or regular systems in order to protect the occupants and the aircraft from harm during a critical condition requiring immediate response. Steps of procedures enclosed in a box such as this ⬚ should be accomplished without the aid of the checklist.

Section IV — ABNORMAL PROCEDURES containing FAA approved operating procedures requiring the use of special systems and/or alternate use of regular systems which, if followed, will maintain an acceptable level of airworthiness or reduce operational risk resulting from a failure condition.

Section V — PERFORMANCE containing FAA approved data defining the aircraft performance under standard performance conditions. Refer to RETENTION OF FLIGHT MANUAL PERFORMANCE DATA in this Introduction.

Section VI — SUPPLEMENTS containing FAA Approved Airplane Flight Manual Supplements. These supplements contain operating limitations, procedures, and performance data and other necessary data for aircraft conducting special operations and/or equipped with specific equipment requiring the supplement.

Section VII — WEIGHT AND BALANCE DATA contains data intended to assist the operator in ensuring that the aircraft is properly loaded.

INTRODUCTION (CONT)

Section I through Section V is composed of material approved by the Federal Aviation Administration and together with the FAA Approved Airplane Flight Manual Supplements in Section VI constitute the FAA Approved Airplane Flight Manual. Section VII (Weight and Balance Data) is not FAA approved material but is included in this manual for the operator's convenience.

NOTE Section VII (Weight and Balance Data) is complete within itself and includes a List of Effective Pages. Therefore, Section VII may be revised in the same manner in which the FAA Approved Airplane Flight Manual portion is revised.

REVISING THE MANUAL

The data presented in this manual is the result of extensive flight tests and has been approved by the Federal Aviation Administration. However, development does not stop with the issuance of this manual and as new procedures are developed they will be forwarded to the holder of this manual. Revised material will be in the form of Temporary Flight Manual Changes or Numbered Changes. It is the responsibility of the operator to ensure that the Flight Manual is current at all times. Therefore, it is very important that changes (temporary or numbered) be incorporated in the manual as soon as they are received.

TEMPORARY FLIGHT MANUAL CHANGES

Temporary Flight Manual Changes may be issued against the Flight Manual when required. These changes generally contain material that is not so extensive as to require a Numbered Change and allow Learjet to transmit revised data to the operator faster than with the Numbered Change system. Temporary Flight Manual Changes are printed on yellow paper and include all necessary information (Publication Affected, Description of Change, and Filing Instructions) on the change itself. Temporary Flight Manual Changes are to be retained in the Flight Manual until removed by some other authority — usually a superseding Temporary Change or a Numbered Change.

INTRODUCTION (CONT)

NUMBERED CHANGES

Numbered Changes issued against the Flight Manual differ from Temporary Flight Manual Changes in that the pages contained in the Numbered Change supersede like pages in the Flight Manual. Each page in a Numbered Change has a “Change” number located at the lower corner of the page immediately below the FAA Approved date. Portions of the text affected by the change are indicated by a vertical bar at the outer margin of the page. The vertical bars may not appear on pages that contain changes to graphs or tables. Additionally, when a “changed” page is the result of a rearrangement of material due to a change on a previous page no vertical bar will appear.

The List of Effective Pages provides the user with a guide to establish the current effective date of each page in the Flight Manual and an instruction sheet for incorporating the latest Numbered Change into the Flight Manual. Information included in the List of Effective Pages states the current Change Number for each page, the dates of Original issue and Numbered Changes, and the Temporary Flight Manual Changes the current Numbered Change supersedes. An asterisk (*) next to a page number indicates pages changed, added, or deleted by the current change.

NOTE

Numbered Changes do not automatically supersede all outstanding Temporary Flight Manual Changes. Follow instructions given in “Note” on List of Effective Pages to determine which Temporary Flight Manual Changes to remove when incorporating a Numbered Change.

RETENTION OF FLIGHT MANUAL PERFORMANCE DATA

The performance data in Section V of this manual provides performance data for all aircraft with the same model designation rather than performance data for a specific serial number aircraft. Therefore, due to serial number changes or the incorporation of Airplane Modification Kits (AMK’s), Airplane Accessory Kits (AAK’s) or Service Bulletins, performance charts may be issued against this Flight Manual which are not applicable to the specific aircraft assigned to the Flight Manual. It is permissible to relocate performance data not applicable to your specific aircraft to the rear of the manual.

NOTE

Retention of relocated performance data is required as all pages listed on the List of Effective Pages constitute a complete FAA Approved Airplane Flight Manual. Additionally, even though some data may be relocated, all changes must be incorporated and the manual kept current.

INTRODUCTION (CONT)

NOTES, CAUTIONS, AND WARNINGS

Notes, Cautions, and Warnings are used throughout this manual to focus attention on special conditions or procedures as follows:

NOTE	Notes are used to highlight specific operating conditions or steps of a procedure.
CAUTION	Cautions are used to call attention to operating procedures which, if not strictly observed, may result in damage to equipment.
WARNING	Warnings are used to call attention to operating procedures which, if not strictly adhered to, may result in personal injury or loss of life.

OTHER PUBLICATIONS

The following is a list of Learjet publications referenced in this Airplane Flight Manual. Such references in this manual are made by number and do not contain any revision indication. However, such references are to be understood as “the latest revision”.

AIRPLANE ACCESSORY KITS (AAK)

AAK 77-8	Increase Takeoff Gross Weight to 18,000 Pounds
AAK 79-4	Installation of Conical Fan Spinner for TFE 731 Engines
AAK 80-2	Increase Takeoff Gross Weight to 18,300 Pounds
AAK 80-3	Increase Landing Gross Weight to 15,300 Pounds
AAK 81-1	Installation of Starter Secondary Electrical Contactors
AAK 83-2	Installation of FC-530 Autopilot
AAK 86-1	Windshield Defog Improvement

INTRODUCTION (CONT)

AIRPLANE MODIFICATION KITS (AMK)

AMK 76-7	Relocation of Cabin Air Distribution Flow Control Valve
AMK 78-13	Installation of Split Essential Bus Electrical System
AMK 80-17	Installation of Current Limiter Warning and Starter Indicator Lights
AMK 85-1	Electrical Power Distribution Improvement
AMK 90-3	Installation of Emergency Pressurization Control Circuit Breakers
AMK 91-2	Replacement of Windshield Anti-ice Thermostats

ENGINEERING CHANGE RECORDS (ECR)

ECR 1495	18,000 Pounds T.O.G.W.
ECR 2234	Takeoff Gross Weight Increase

FIELD CHANGE NOTICES (FCN)

FCN 85-6	Replacement of Airspeed Limitation Placard
FCN 89-1	Freon Air Conditioner Motor Altitude Limitations

SERVICE BULLETINS (SB)

SB 35/36-21-17	Installation of Windshield Auxiliary Defog Heat System
SB 35/36-21-26	Modification of Cabin Auxiliary Heater
SB 35/36-22-7	Installation of Autopilot Accelerometer Monitor Assembly
SB 35/36-28-11	Installation of Standby Fuel Pump Annunciators
SB 35/36-32-4	Replacement of Landing Gear Hydraulic Selector Valve

SECTION I — LIMITATIONS

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GENERAL

CERTIFICATION STATUS

This airplane is certified in accordance with FAR 25.

TYPE OF OPERATION

This aircraft is approved for VFR, IFR, day, night, and icing conditions.

When icing or frost conditions exist, this airplane must be inspected and operated in accordance with the Cold Weather Operation procedures of Section II. These procedures include the requirement to assure that all critical surfaces of the airplane (wing, vertical and horizontal stabilizers, flight control surfaces, spoilers and flaps) are free of frost, ice and snow for takeoff. Conducting only a visual inspection may not detect very small levels of contamination; therefore, a tactile (hand on surface) check of the wing leading edge and adjacent wing upper surface is required when the ambient temperature is less than 10° C (50° F).

PERFORMANCE CONFIGURATION

The airplane configuration must be as presented under Standard Performance Conditions in Section V.

MINIMUM FLIGHT CREW

The minimum flight crew shall consist of pilot and copilot.

MANEUVERS

No aerobatic maneuvers, including spins, are approved.

Intentional stalls (pusher actuations) are prohibited above 18,000 feet with flaps and/or landing gear extended.

WEIGHT AND C.G. LIMITS

MAXIMUM RAMP WEIGHT

NOTE

Ramp Weight shall not exceed Maximum Allowable Takeoff Weight by more than 250 lbs (113 kg).

MODEL 35A:

• *Serials 35-067 and subsequent not incorporating ECR 1495, ECR 2234, AAK 77-8, or AAK 80-2*	17,250 Pounds 7,825 kg
• *Serials 35-067 thru 35-344 when incorporating ECR 1495 or AAK 77-8*	18,250 Pounds 8,278 kg
• *Serials 35-067 thru 35-344 when incorporating AAK 80-2*	18,500 Pounds 8,392 kg
• *Serials 35-345 and subsequent when incorporating ECR 2234*	18,500 Pounds 8,392 kg

MODEL 36A:

• *Serials 36-018 thru 36-045 not incorporating AAK 80-2*	18,250 Pounds 8,278 kg
• *Serials 36-018 thru 36-045 when incorporating AAK 80-2*	18,500 Pounds 8,392 kg
• *Serials 36-046 and subsequent*	18,500 Pounds 8,392 kg

WEIGHT AND C.G. LIMITS (CONT)

MAXIMUM CERTIFIED TAKEOFF WEIGHT

MODEL 35A:

• *Serials 35-067 and subsequent not incorporating ECR 1495, ECR 2234, AAK 77-8, or AAK 80-2*	17,000 Pounds 7,711 kg
• *Serials 35-067 thru 35-344 when incorporating ECR 1495 or AAK 77-8*	18,000 Pounds 8,165 kg
• *Serials 35-067 thru 35-344 when incorporating AAK 80-2*	18,300 Pounds 8,301 kg
• *Serials 35-345 and subsequent when incorporating ECR 2234*	18,300 Pounds 8,301 kg

MODEL 36A:

• *Serials 36-018 thru 36-045 not incorporating AAK 80-2*	18,000 Pounds 8,165 kg
• *Serials 36-018 thru 36-045 when incorporating AAK 80-2*	18,300 Pounds 8,301 kg
• *Serials 36-046 and subsequent*	18,300 Pounds 8,301 kg

MAXIMUM ZERO WING AND TIP FUEL WEIGHT	13,500 Pounds 6,124 kg

NOTE

All weights in excess of 13,500 pounds must consist of wing and tip tank fuel, except as follows:

1. The Maximum Zero Wing and Tip Fuel Weight may be increased to 14,000 pounds by adding up to 500 pounds of additional fuselage fuel. The additional fuselage fuel must be transferred prior to reaching a total wing fuel quantity of 2250 pounds.
2. In the event the additional fuselage fuel cannot be transferred, V_{MO} must be reduced to 325 KIAS.

WEIGHT AND C.G. LIMITS (CONT)

MAXIMUM ALLOWABLE TAKEOFF WEIGHT

The takeoff weight is limited by the most restrictive of the following requirements:

- Maximum Certified Takeoff Weight.
- Maximum Takeoff Weight (Climb or Brake Energy Limited) for altitude and temperature as determined from the applicable figure entitled TAKEOFF WEIGHT LIMITS in Section V.
- Maximum Takeoff Weight for the runway and ambient conditions as determined from the applicable figure entitled TAKEOFF DISTANCE in Section V.
- Maximum Takeoff Weight for obstacle clearance as determined from the applicable TAKEOFF FLIGHT PATH and CLIMB GRADIENT figures in Section V. (FAR 121 and 135 as applicable to U.S. registered aircraft.)

MAXIMUM CERTIFIED LANDING WEIGHT

MODEL 35A:

• *Serials 35-067 thru 35-344 not incorporating AAK 80-3*	14,300 Pounds 6,486 kg
• *Serials 35-067 thru 35-344 when incorporating AAK 80-3*	15,300 Pounds 6,940 kg
• *Serials 35-345 and subsequent*	15,300 Pounds 6,940 kg

MODEL 36A:

• *Serials 36-018 thru 36-045 not incorporating AAK 80-3*	14,300 Pounds 6,486 kg
• *Serials 36-018 thru 36-045 when incorporating AAK 80-3*	15,300 Pounds 6,940 kg
• *Serials 36-046 and subsequent*	15,300 Pounds 6,940 kg

WEIGHT AND C.G. LIMITS (CONT)

MAXIMUM ALLOWABLE LANDING WEIGHT

The landing weight is limited by the most restrictive of the following requirements:

- Maximum Certified Landing Weight.

NOTE Perform Hard or Overweight Landing Inspection (Chapter 5, 35/36/35A/36A Maintenance Manual) if Maximum Certified Landing Weight is exceeded.

- Maximum Landing Weight for the runway and ambient conditions as determined from the applicable LANDING DISTANCE chart in Section V.
- Maximum Landing Weight (Approach Climb or Brake Energy Limited) for altitude and temperature as determined from the applicable figure entitled LANDING WEIGHT LIMITS in Section V.

CENTER-OF-GRAVITY ENVELOPE

- *Aircraft Certified for 17,000 Pounds Takeoff Weight.* The forward C.G. limit is Fuselage Station (F.S.) 366.31 (5% MAC) for all weights up to and including 10,000 pounds and tapers through F.S. 375.96 (16.66% MAC) at 17,000 pounds to F.S. 376.31 (17.09% MAC) at 17,250 pounds. The aft C.G. limit is F.S. 387.00 (30% MAC) for all weights. Refer to Figure 1-1.
- *Aircraft Certified for 18,000 Pounds Takeoff Weight.* The forward C.G. limit is Fuselage Station (F.S.) 366.31 (5% MAC) for all weights up to and including 10,000 pounds and tapers through F.S. 377.34 (18.33% MAC) at 18,000 pounds to F.S. 377.69 (18.76% MAC) at 18,250 pounds. The aft C.G. limit is F.S. 387.00 (30% MAC) at all weights. Refer to Figure 1-1A.
- *Aircraft Certified for 18,300 Pounds Takeoff Weight.* The forward C.G. limit is Fuselage Station (F.S.) 366.31 (5% MAC) for all weights up to and including 10,000 pounds and tapers through F.S. 377.75 (18.83% MAC) at 18,300 pounds to F.S. 378.03 (19.17% MAC) at 18,500 pounds. The aft C.G. limit is F.S. 387.00 (30% MAC) at all weights. Refer to Figure 1-2.

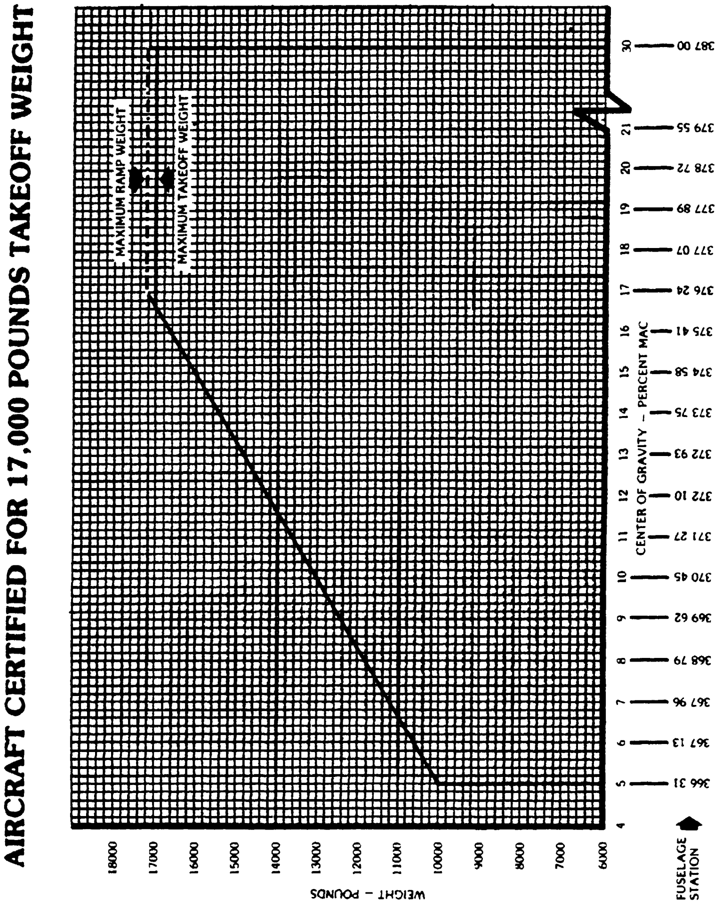

AIRCRAFT CERTIFIED FOR 17,000 POUNDS TAKEOFF WEIGHT
MAXIMUM RAMP WEIGHT
MAXIMUM TAKEOFF WEIGHT
WEIGHT – POUNDS
18000
17000
16000
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
CENTER OF GRAVITY – PERCENT MAC
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
30
FUSELAGE STATION
366 31
367 13
367 96
368 79
369 62
370 45
371 27
372 10
372 93
373 75
374 58
375 41
376 24
377 07
377 89
378 72
379 55
387 00

Figure 1-1

AIRCRAFT CERTIFIED FOR 18,000 POUNDS TAKEOFF WEIGHT

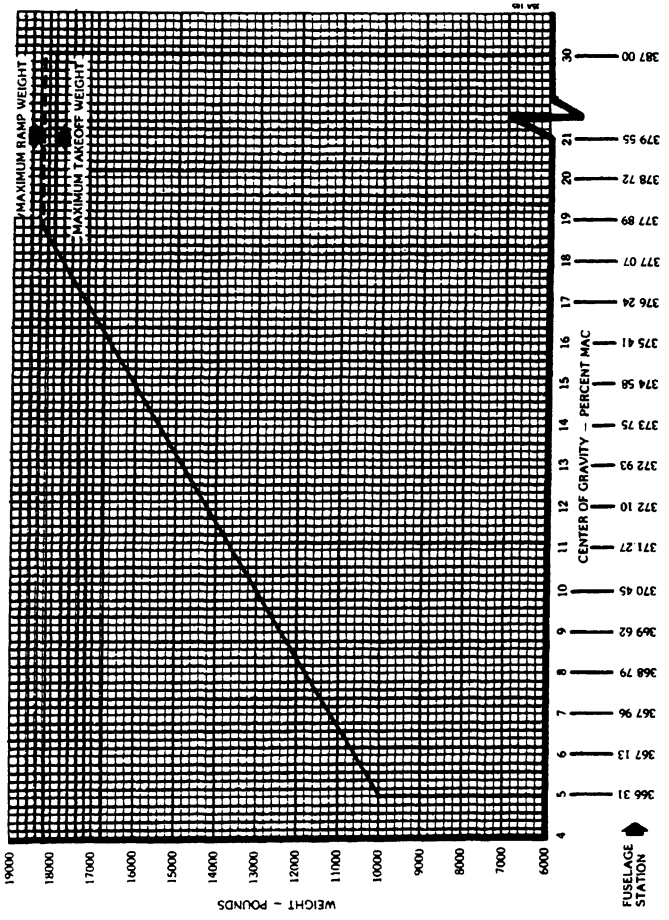


Figure 1-1A

AIRCRAFT CERTIFIED FOR 18,300 POUNDS TAKEOFF WEIGHT

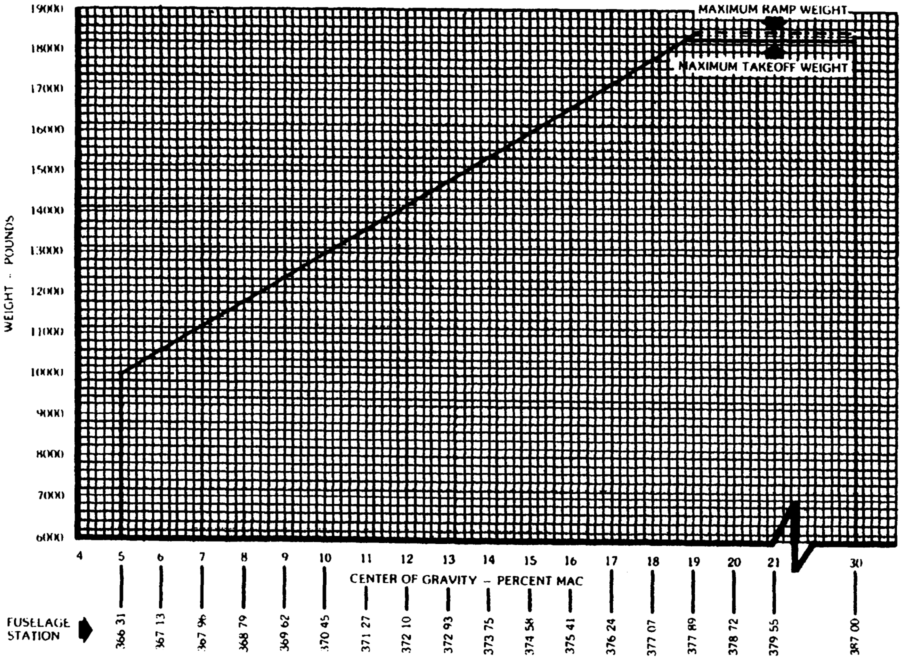


Figure 1-2

AIRSPEED/MACH LIMITS

NOTE All Airspeed/Mach Limits are expressed in terms of indicated values unless otherwise stated. Instrument error is assumed to be zero.

MAXIMUM OPERATING SPEED V_{MO}/M_{MO}

WARNING **Do not** extend spoilers, or operate with spoilers deployed, at speeds above V_{MO}/M_{MO} due to significant nose-down pitching moment associated with spoiler deployment.

V_{MO}/M_{MO} shall not be deliberately exceeded in any regime of flight (climb, cruise or descent) unless a higher speed is authorized for flight test.

V_{MO}

Aircraft 35-067 thru 35-670 and 36-018 thru 36-063:

- Up to 8000 feet .... 300 KIAS
- 8000 feet and above .... 350 KIAS

Aircraft 35-671 & Subsequent and 36-064 & Subsequent:

- All Altitudes .... 350 KIAS

M_{MO} .... 0.81 M_I

M_{MO} with any missing Boundary Layer Energizers .... 0.77 M_I

M_{MO} Mach Trim and Autopilot disengaged or inoperative .... 0.74 M_I

M_{MO} Stick Puller inoperative .... 0.74 M_I

Refer to figure 1-3 or 1-3A, entitled AIRSPEED/MACH LIMITS.

MANEUVERING SPEED V_A

CAUTION Avoid rapid and large alternating control inputs, especially in combinations with large changes in pitch, roll or yaw, as they may cause structural failure at any speed, including below V_A.

Refer to figure 1-3 or 1-3A entitled AIRSPEED/MACH LIMITS, this section for V_A. Maneuvers involving full application of rudder and aileron controls, as well as maneuvers that involve pusher angles of attack should be confined to speeds below V_A.

MAXIMUM LANDING GEAR OPERATING SPEED V_{LO}

V_{LO} is the maximum speed at which the landing gear can be safely extended or retracted.

V_{LO} .... 200 KIAS

AIRSPEED/MACH LIMITS

Aircraft 35-067 thru 35-670 and 36-018 thru 36-063

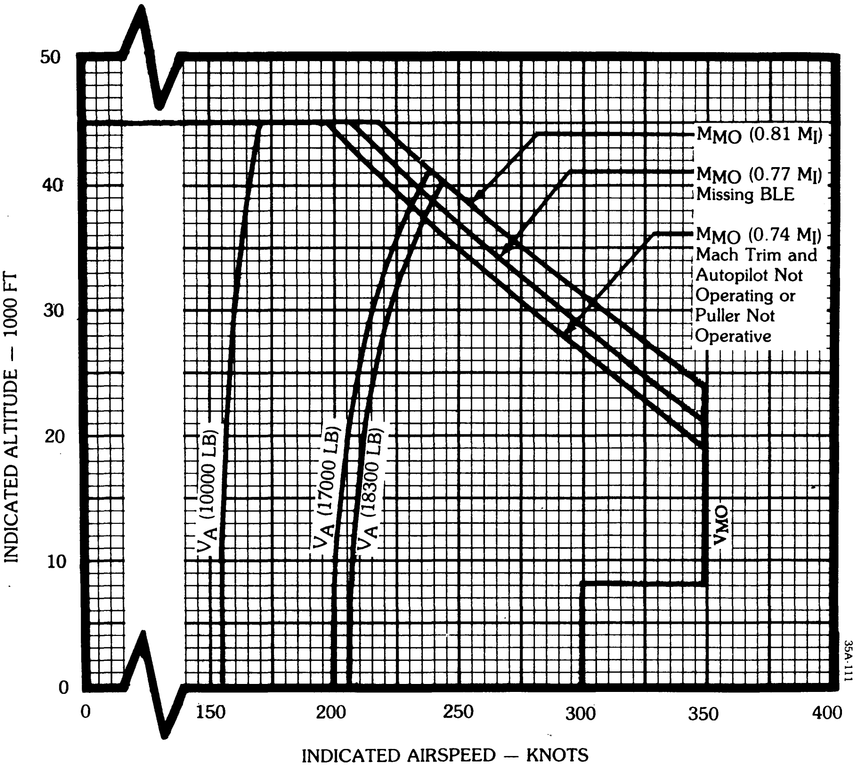


Figure 1-3

AIRSPEED/MACH LIMITS

Aircraft 35-671 & Subsequent and 36-064 & Subsequent

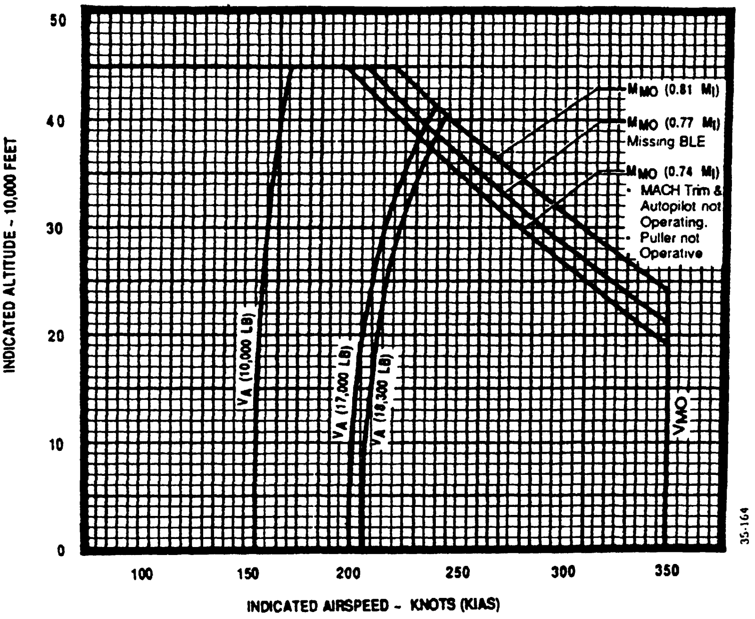


Figure 1-3A

AIRSPEED/MACH LIMITS (CONT)

MAXIMUM LANDING GEAR EXTENDED SPEED V_{LE}

V_{LE} is the maximum speed at which the aircraft can be safely flown with the landing gear extended.

V_{LE} .... 260 KIAS

MAXIMUM FLAP EXTENDED SPEED V_{FE}

V_{FE} is the maximum speed permissible with the wing flaps in a prescribed extended position.

V_{FE} — Flaps 1° to 8° .... 200 KIAS

V_{FE} — Flaps 9° to 20°

- *Aircraft 35-408, 35-447, 35-462, 35-473, 35-496, 35-506 thru 35-603, 36-025 and 36-055 when not incorporating FCN 85-6*.................... 185 KIAS
- *All other serial aircraft and aircraft incorporating FCN 85-6*.................. 200 KIAS

V_{FE} — Flaps 21° to 40° .... 150 KIAS

MINIMUM CONTROL SPEED AIR V_{MCA}

V_{MCA} is the minimum flight speed at which the airplane is controllable with 5° bank when one engine suddenly becomes inoperative and the remaining engine is operating at takeoff thrust.

V_{MCA} is a function of altitude and temperature. The speed shown is a maximum, which occurs at Sea Level, -18°C (0°F). Section V Performance Charts account for the appropriate values.

V_{MCA} -18°C (0°F) at Sea Level .... 110 KIAS

MINIMUM CONTROL SPEED GROUND V_{MCG}

V_{MCG} is the minimum speed on the ground at which control can be maintained, using aerodynamic controls alone, when one engine suddenly becomes inoperative and the remaining engine is operating at takeoff thrust.

V_{MCG} is a function of altitude and temperature. The speed shown is a maximum, which occurs at Sea Level, -18°C (0°F). Section V Performance Charts account for the appropriate values.

V_{MCG} -18°C (0°F) at Sea Level .... 103 KIAS

AIRSPEED/MACH LIMITS (CONT)

CRITICAL ENGINE FAILURE SPEED V_1

Refer to applicable figure entitled CRITICAL ENGINE FAILURE SPEED V_1 in Section V.

ROTATION SPEED V_R

Refer to applicable figure entitled ROTATION SPEED V_R in Section V.

TAKEOFF SAFETY SPEED V_2

Refer to applicable figure entitled TAKEOFF SAFETY SPEED V_2 in Section V.

AMBIENT TEMPERATURE LIMITS

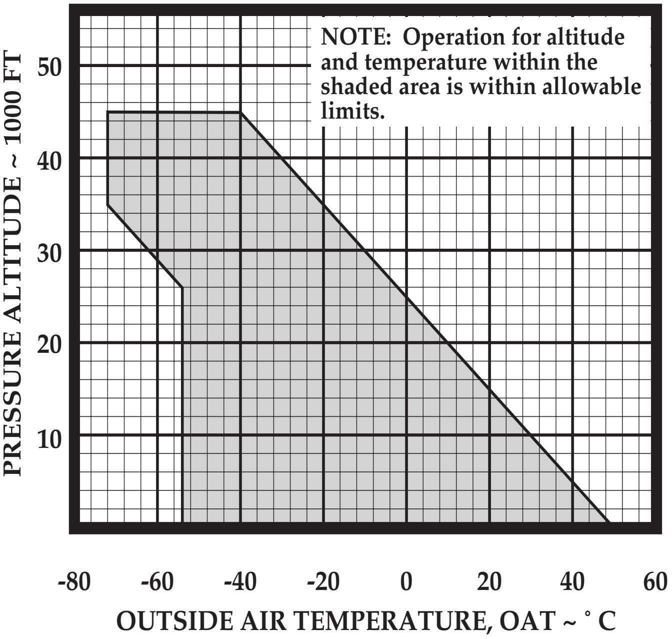


Figure 1-3B

TAKEOFF AND LANDING OPERATIONAL LIMITS

TEMPERATURE LIMITS

Refer to AMBIENT TEMPERATURE LIMITS, Figure 1-3B.

NOTE Refer to FUEL TEMPERATURE LIMITS, this section.

MAXIMUM ALTITUDE

Pressure Altitude .... 10,000 Feet

WIND COMPONENTS

MAXIMUM TAILWIND COMPONENT .... 10 Knots

DEMONSTRATED CROSSWIND COMPONENT

Refer to METEOROLOGICAL DEFINITIONS in Section V — PERFORMANCE.

RUNWAY CONDITIONS

Takeoff and landing is limited to paved runways.

Do not operate if water and/or slush accumulation on the runway exceeds 3/4 inch (19 mm).

MAXIMUM NOSE WHEEL STEERING SPEED

Maximum .... 45 KNOTS GROUND SPEED

With any two of the following three Anti-Skid System lights illuminated: Two inboard and right outboard .... 10 KNOTS GROUND SPEED

TIRE LIMITING SPEED

Main Tires .... 182 KNOTS GROUND SPEED

TIP TANK FUEL

Maximum tip tank fuel for landing is 925 pounds (420 kg) each tip tank.

TAKEOFF AND LANDING OPERATIONAL LIMITS (CONT)

MINIMUM FUEL

Fuel Load — Minimum 600 pounds (272 kg) in each wing required for takeoff and intentional go-around.

PRESSURIZATION

Do not takeoff or land with the cabin pressurized. Adhere to PRESSURIZATION SYSTEM OPERATION, Section II.

SEAT BELTS

Seat belts and shoulder harnesses must be worn during takeoff and landing.

ENROUTE OPERATIONAL LIMITS

TEMPERATURE LIMITS

Refer to AMBIENT TEMPERATURE LIMITS, Figure 1-3B.

MAXIMUM OPERATING ALTITUDE

The maximum operating altitude is 45,000 feet. This is the highest altitude for which acceptable flight characteristics and systems operation have been demonstrated.

FLIGHT LOAD ACCELERATION LIMITS

Flaps Up	+3.0 g to -1.0 g
Flaps Down	+2.0 g to 0.0 g

NOTE These acceleration values limit the bank angle in a level coordinated turn to 70° (flaps up) and 60° (flaps down). In addition, pullups and pushovers must be limited to these values.

SYSTEM LIMITS

ELECTRICAL SYSTEM *(Aircraft 35-067 thru 35-389 except 35-370 and 36-018 thru 36-047 not incorporating AMK 80-17 or AAK 81-1)*

The battery charging bus current limiter and starter disengagement checks, as outlined in STARTING ENGINES, TAXI, STARTER ASSIST AIRSTARTS, and QUICK TURN-AROUND procedures in Sections II and III of this manual, must be accomplished whenever an engine start using a starter has been performed. These checks require that both engines be operating to perform the check.

ENGINE SYNCHRONIZER

Engine sync must be OFF for takeoff, landing, and single-engine operation.

EXTERNAL POWER

The maximum amperage from an external power source is limited to 1100 amps.

FREON COOLING SYSTEM

- *Aircraft 35-067 thru 35-505 and 36-018 thru 36-053 not incorporating FCN 89-1.* The freon cooling system must be off above FL180.
- *Aircraft 35-506 and subsequent, 36-054 and subsequent and prior aircraft incorporating FCN 89-1.* The freon cooling system must be off above FL350.

GENERATOR LIMITS

Generator output is limited as follows:

- 320 amps maximum for ground operations.
- 400 amps maximum for flight operations.

HYDRAULIC SYSTEM

Do not exceed auxiliary hydraulic pump duty cycle of 3 minutes ON, then 20 minutes OFF.

Only hydraulic fluid conforming to MIL-H-5606 is approved.

SYSTEM LIMITS (CONT)
OXYGEN SYSTEM

The following aircraft certification requirements are in addition to the requirements of applicable operating rules. The most restrictive requirement (certification or operating) must be observed.

On aircraft with Scott ATO crew masks, hats and "ear-muff" type headsets must be removed prior to donning crew oxygen masks.

NOTE Headsets, eyeglasses, or hats worn by crew members may interfere with quick-donning capabilities.

Crew and passenger oxygen masks are not approved for use above 40,000 feet **cabin** altitude.

WARNING

- Passenger masks are intended for use during an emergency descent to an altitude not requiring supplemental oxygen.
- Passenger masks will not provide sufficient oxygen for prolonged operation above 34,000 feet cabin altitude. Prolonged operation above 25,000 feet cabin altitude with passengers on board is not recommended.

Aircraft 35-067 thru 35-112 except 35-107 and aircraft 36-018 thru 36-031.

Above Flight Level 250 —

- *Aircraft with ZMR 100 Series Crew Masks* — One crew member must wear oxygen mask around his neck.
- *Aircraft with 6600214 Series Crew Masks* — Crew masks must be in the quick-donning position which allows donning within 5 seconds.

Above Flight Level 410 — Pilot, copilot and passengers must wear oxygen masks.

Aircraft 35-107, 35-113 and subsequent and aircraft 36-032 and subsequent.

Above Flight Level 250 — Crew masks must be in the quick-donning position which allows donning within 5 seconds.

SYSTEM LIMITS (CONT)

PRESSURIZATION LIMIT

Maximum Differential Pressure .... 10.0 PSI

SPOILER

Do not extend spoilers with flaps extended while airborne.

Do not extend spoilers, or operate with spoilers deployed, at speeds above VMO/MMO.

STALL WARNING SYSTEM

Both stall warning systems must be on and operating and remain on throughout flight. The systems may be turned off per EMERGENCY and ABNORMAL PROCEDURES in Section III and Section IV of this manual and for stall warning system maintenance per the Maintenance Manual procedures.

NOTE Warning lights for both stall warning systems are inoperative when the generator and battery switches are OFF.

To ensure proper stall warning system operation, the BEFORE STARTING ENGINES and AFTER TAKEOFF stall warning system operation and comparison checks must be accomplished in accordance with Section II of this manual.

WARNING If, during flight, the shaker is not accompanied by the nudger, **do not decelerate further**.

THRUST REVERSERS (IF INSTALLED)

When thrust reversers are installed, refer to the applicable Thrust Reverser Supplement for limitations, normal procedures, emergency procedures, abnormal procedures, and performance data.

SYSTEM LIMITS (CONT)

TRIM SYSTEMS

To ensure proper trim systems operation, the BEFORE STARTING ENGINES trim systems checks must be successfully completed in accordance with Section II of this manual.

The complete TRIM SYSTEMS OPERATIONAL CHECK in Section II of this manual shall be successfully completed a minimum of once every 10 hours of airplane flight operation.

WARNING

Failure to conduct a pitch trim preflight check prior to **each** flight increases the probability of an undetected system failure. An additional single failure in the trim system could result in a trim runaway.

WINDSHIELD AND RADOME ANTI-ICE FLUID

Methyl Alcohol (Methanol) per Federal Specification O-M-232, Grade A, is required.

YAW DAMPER

To ensure proper yaw damper operation, the BEFORE STARTING ENGINES yaw damper operational check in Section II of this manual must be successfully completed before each flight.

One yaw damper must be ON and operative for all flight conditions except takeoff and for trimming rudder. For landing, one yaw damper must be ON except as permitted in ABNORMAL PROCEDURES in Section IV of this manual.

NOTE

Yaw damper should be turned off while using rudder trim. Reengage yaw damper after trim is established.

POWERPLANT LIMITS

ENGINE SPEED LIMITS

CONDITION	LIMIT
OVERSPEED ❶	105% N_1 or N_2
TRANSIENT ❷	
5 SECONDS	103-105% N_1 or N_2
1 MINUTE	100-103% N_1 or N_2
TAKEOFF ❸	Refer to TAKEOFF POWER SETTING charts in Section V.
MAXIMUM CONTINUOUS ❸	Refer to MAXIMUM CONTINUOUS THRUST tables in Section V.

❶ If overspeed limit is exceeded, contact nearest Honeywell Field Service Propulsion Engine Representative prior to engine removal for overspeed inspection.

❷ If limit is exceeded, reduce thrust to within limits and make necessary fuel control adjustment prior to next flight.

❸ Thrust settings above performance chart values may exceed engine rated thrust.

ENGINE OPERATING TEMPERATURES

Refer to Figure 1-4 and Figure 1-5, TURBINE TEMPERATURE LIMITS.

OIL LIMITS

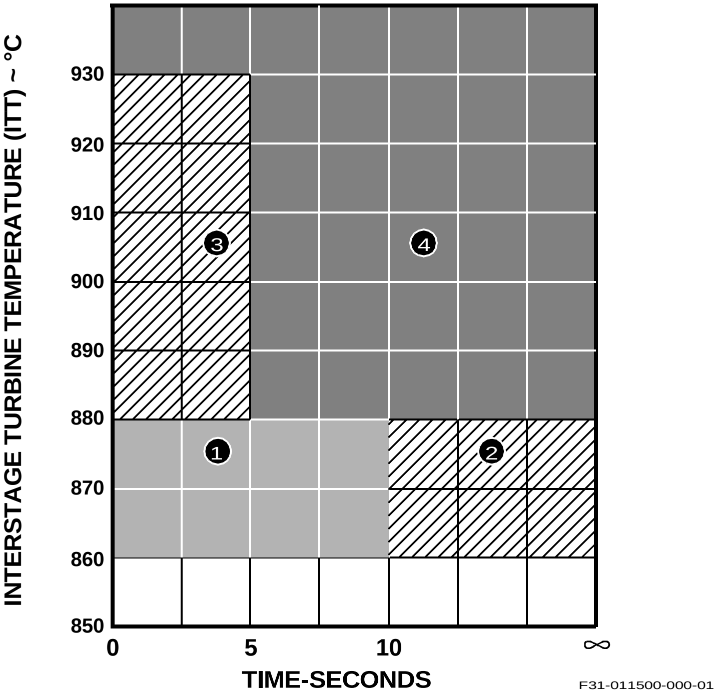
OIL TEMPERATURE

Maximum Oil Temperature .... 140°C

APPROVED OILS

Oils conforming to Garrett specification EMS 53110, Type II are approved. Refer to Addendum — ENGINE OIL SERVICING for a listing of approved oils.

TURBINE TEMPERATURE LIMITS (ITT)
STARTING



❶ Abort start. Record maximum ITT and time in excess of 860°C in engine log book. Determine cause and correct prior to next start.

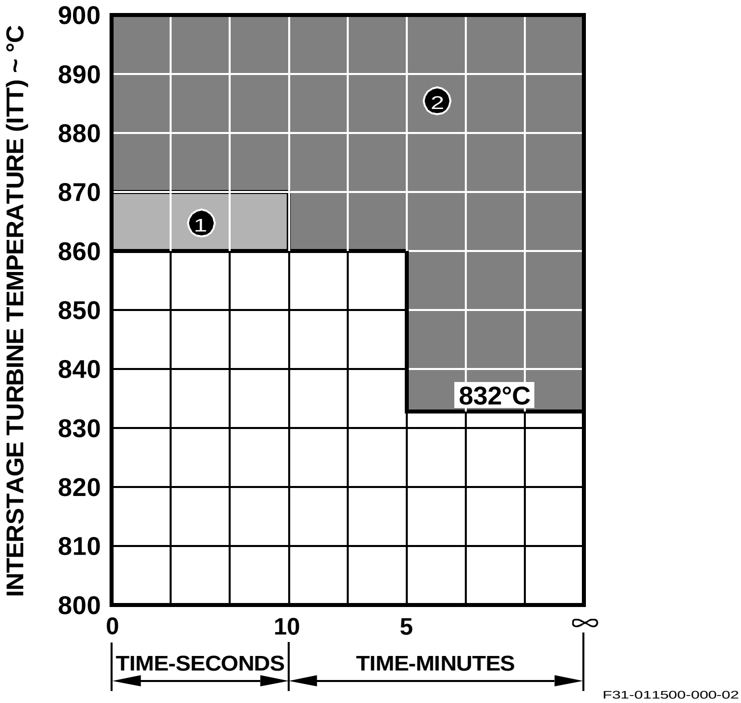
❷ Abort start. Record maximum ITT and time in excess of 860°C in engine log book. Refer to *Honeywell Engine Light Maintenance Manual* for static takeoff power check.

❸ Abort start. Record maximum ITT and time in excess of 880°C in engine log book. Refer to *Honeywell Engine Light Maintenance Manual* for static takeoff power check.

❹ Abort start. Record maximum ITT temperature and time in excess of 880°C in engine log book. Refer to *Honeywell Engine Light Maintenance Manual* for hot section inspection before further engine operation.

Figure 1-4

TURBINE TEMPERATURE LIMITS (ITT)
EXCEPT STARTING



❶ Takeoff Transient Limit. Reduce thrust setting to within limits and make electronic computer N1 adjustment before next flight. Record maximum ITT and time in excess of limit in engine log book. Observe takeoff ITT limit.

❷ Record maximum ITT and time in excess of limit in engine log book. Refer to *Honeywell Engine Light Maintenance Manual* for hot section inspection.

NOTE

Maximum continuous limit is 832°C. For greatest engine life it is recommended that, under normal conditions, engine thrust be reduced to an ITT of 795°C or less after 30 minutes of maximum continuous operation.

Figure 1-5

FUEL LIMITS

FUEL TEMPERATURE

Do not take off with fuels other than JP-4 or equivalent at fuel temperatures below -29°C (-20°F).

Do not take off with fuel temperature lower than -54°C (-65°F).

UNUSABLE FUEL

The fuel remaining in the fuel tanks when the fuel quantity indicator reads zero is not usable in flight.

FUEL ADDITIVES

ANTI-ICING ADDITIVE

Fuel anti-icing additive meeting the requirements of MIL-I-27686 or MIL-I-85470 is required. Any approved or emergency fuels not containing the required anti-icing additive must have it blended during refueling. The additive concentration, by volume, shall be as follows:

	Concentration by Volume	
Additive Type	**Minimum**	**Maximum**
MIL-I-27686	0.06%	0.15%
MIL-I-85470	0.10%	0.15%

NOTE

Anti-icing additive conforming to MIL-I-85470 does not inhibit microbial growth. For microbial protection, it is recommended that fuel containing either an approved biocide additive or an anti-icing additive conforming to MIL-I-27686 be used at least once a week for aircraft in regular use and whenever a fueled aircraft will be out of service for a week or more.

Refer to Addendum — FUEL SERVICING for additional information and the proper anti-icing additive blending procedure.

CAUTION

Lack of anti-icing additive may cause fuel filter icing and subsequent engine flameout.

BIOCIDE ADDITIVE

Biocide additive is not a requirement. Refer to Addendum — FUEL SERVICING for additional information.

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FUEL LIMITS (CONT)

ELECTRONIC FUEL COMPUTER SPECIFIC GRAVITY

WARNING Engine surge may occur if the recommended specific gravity adjustment is not adhered to for the type of fuel being used. If surge is encountered, refer to the Engine Maintenance Manual.

CAUTION A decrease in the specific gravity setting, on the fuel computer, without a change in fuel specific gravity, results in higher turbine temperatures in start, acceleration and deceleration.

The engine electronic fuel computer must be adjusted to the recommended specific gravity setting in the Engine Log Book for the type of fuel being used. If no entry is made in the Engine Log Book, the following settings must be observed:

- Jet A, Jet A-1, JP-5 and JP-8 .... Position 5
- Jet B and JP-4 .... Position 6
- 50% or more Aviation Gasoline .... Position 7

NOTE Fuel adjustment knob may be rotated one "click" either direction from the recommended fuel adjustment of positions 5, 6 and 7 to compensate for individual engine characteristics or installation effects.

Refer to Addendum — FUEL SERVICING for adjustment procedures.

NOTE Due to fuel computer accessibility, fuel computer specific gravity adjustment is not considered a normal pilot function.

FUEL LIMITS (CONT)

APPROVED FUELS

The mixing of fuel types is allowed.

Special precautions to preclude electrostatic discharge must be taken when switch fueling. Refer to Addendum — FUEL SERVICING.

Jet A, Jet A-1, Jet B, JP-4, JP-5 and JP-8 fuels conforming to Garrett Turbine Engine Company Specifications EMS 53111, EMS 53112, EMS 53113 and EMS 53116 are approved. Refer to Addendum — FUEL SERVICING for a listing of approved fuels.

EMERGENCY FUEL

AVIATION GASOLINE

CAUTION

When using any aviation gasoline in the fuel mixture, operation is limited as follows:

1. **Do not** take off with fuel temperature lower than -54°C (-65°F).
2. Restrict airplane flights to below 15,000 feet.
3. Both JET PUMPS and both STANDBY PUMPS Switches **must** be ON and the pumps must be operating.

Aviation gasoline (MIL-D-5572D, Grades 80/87, 100/130 and 115/145) may be used as an emergency fuel and mixed, in any proportion, with various approved jet fuels.

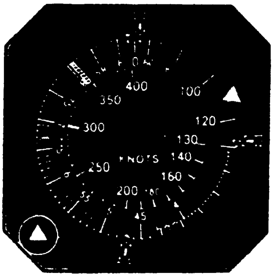
Aviation gasoline may **not** be used in excess of 500 gallons (1892.5 liters) per 100 hours of operation per engine.

INSTRUMENT MARKINGS

AIRSPEED/MACHMETER

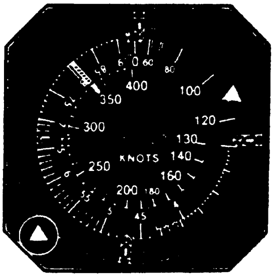
Aircraft 35-067 thru 35-670 and 36-018 thru 36-063

Red Line	300 KIAS
Barber Pole pick-up at	350 KIAS and .81 M_I


400
350
300
250
200
100
120
130
140
160
KNOTS
45

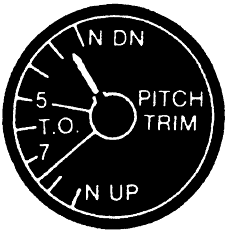
Aircraft 35-671 & Subsequent and 36-064 & Subsequent

Red Line	350 KIAS
Barber Pole pick-up at	350 KIAS and .81 M_I


400
350
300
250
200
100
120
130
140
160
KNOTS
45

TRIM

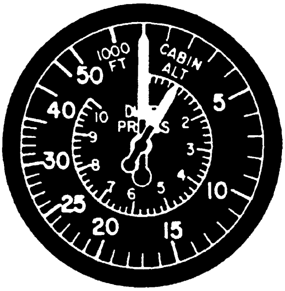
Takeoff Range	5° to 7.6°


N DN
5
T.O.
7
PITCH
TRIM
N UP

CABIN ALTIMETER/DIFFERENTIAL PRESSURE

Aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031

Green Arc	0-8.9 PSI
Yellow Arc	8.9-9.2 PSI
Red Arc	9.2-10.0 PSI


1000
FT
CABIN
ALT
50
40
30
25
20
15
10
5
10
9
8
7
6
5
4
3
2

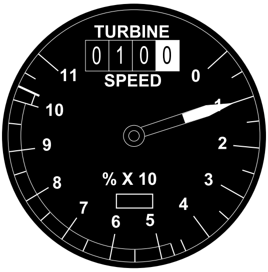
Aircraft 35-107, 35-113 and Subsequent and 36-032 and Subsequent

Green Arc	0-9.4 PSI
Yellow Arc	9.4-9.7 PSI
Red Arc	9.7-10.0 PSI

INSTRUMENT MARKINGS (CONT)

TURBINE SPEED (N2)

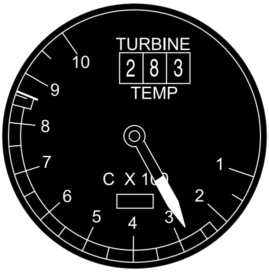
Green Arc	48%-100%
Yellow Arc	100%-103% (One minute limit)
Red Line	103%


TURBINE
0 1 0 0
SPEED
0
1
2
3
4
5
6
7
8
9
10
11
% X 10

TURBINE TEMPERATURE (ITT)

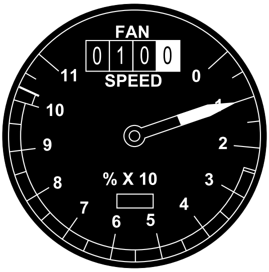
Green Arc	230°C-832°C
Yellow Arc	832°C-860°C
Red Line	860°C

(Refer to Figure 1-4 and Figure 1-5)


TURBINE
2 8 3
TEMP
1
2
3
4
5
6
7
8
9
10
C X 10

FAN SPEED (N1)

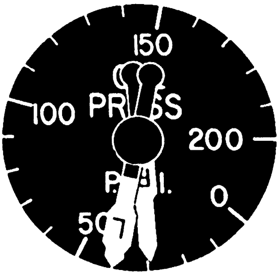
Green Arc	24%-100%
Yellow Arc	100%-103% (One minute limit)
Red Line	103%


FAN
0 1 0 0
SPEED
0
1
2
3
4
5
6
7
8
9
10
11
% X 10

INSTRUMENT MARKINGS (CONT)

OIL PRESSURE

Red Line (Min.)	25 PSI
Yellow Arc	25-38 PSI
Green Arc	38-46 PSI
Yellow Arc	46-55 PSI
Red Line (Max.)	55 PSI

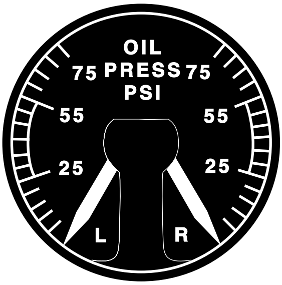

150
100
PRESS
200
P.S.I.
0
50

NOTE Transient oil pressure limit is 55 PSI for 3 minutes maximum.

OR

OIL PRESSURE

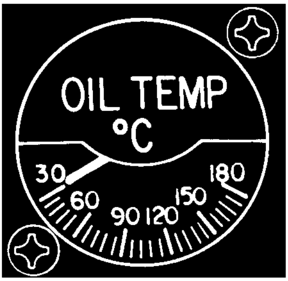
Red Line (Min.)	25 PSI
Yellow Arc	25-38 PSI
Green Arc	38-46 PSI
Yellow Arc	46-55 PSI
Red Line (Max.)	55 PSI


OIL
PRESS
PSI
75
75
55
55
25
25
L
R

NOTE Transient oil pressure limit is 55 PSI for 3 minutes maximum.

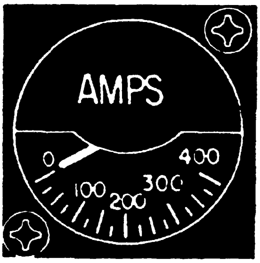
OIL TEMPERATURE

Green Arc	30°C-127°C
Yellow Arc	127°C-140°C
Red Line	140°C


OIL TEMP
°C
30
60
90
120
150
180

INSTRUMENT MARKINGS (CONT)

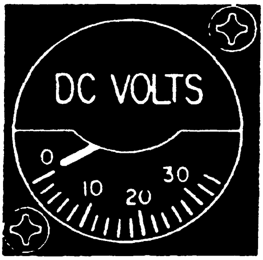
AMMETER


AMPS
0
100
200
300
400

Yellow Arc	320-400 AMPS
Red Line	400 AMPS

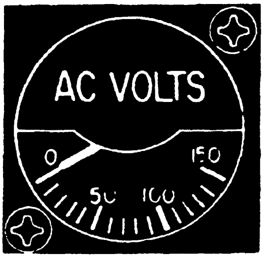
NOTE Do not exceed 320 amps during ground operation.

DC VOLTMETER


DC VOLTS
0
10
20
30

Red Line	32 VOLTS

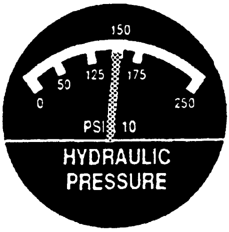
AC VOLTMETER


AC VOLTS
0
50
100
150

Green Arc	110-130 VOLTS

INSTRUMENT MARKINGS (CONT)

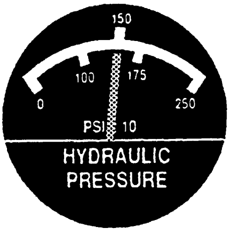
HYDRAULIC PRESSURE


150
50
125
175
0
250
PSI
10
HYDRAULIC
PRESSURE

Aircraft 35-067 thru 35-646 and 36-018 thru 36-058

Yellow Arc	0-500 PSI
Green Arc	1250-1500 PSI
Red Line	1750 PSI

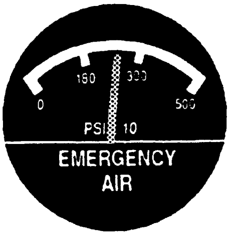
OR


150
100
175
0
250
PSI
10
HYDRAULIC
PRESSURE

Aircraft 35-647 and Subsequent and 36-059 and Subsequent

Yellow Arc	0-1000 PSI
Green Arc	1000-1750 PSI
Red Line	1750 PSI

EMERGENCY AIR


180
300
0
500
PSI
10
EMERGENCY
AIR

Green Arc	1800-3000 PSI
Red Line	3000 PSI

NOTE

If air bottle is serviced near low end of green arc, pressure may drop during flight if system cools; satisfactory gear extension and braking can still be expected.

OR

Yellow Arc	0-1800 PSI
Green Arc	1800-3000 PSI
Red Line	3000 PSI

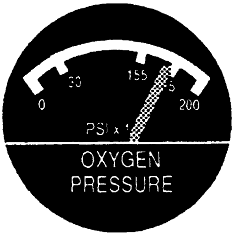
NOTE

If air bottle is serviced near high end of yellow arc (slightly above 1800 psi), pressure may drop during flight if system cools; satisfactory gear extension and braking can still be expected.

INSTRUMENT MARKINGS (CONT)

OXYGEN PRESSURE

Green Arc	1550-1850 PSI
Yellow Arc	0-300 PSI
Red Line	2000 PSI


0
30
155
5
200
PSI x 1
OXYGEN
PRESSURE

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INTRODUCTION TO NORMAL PROCEDURES

The procedures in this section of the manual have been developed by Learjet Inc. for certification of this aircraft. This section contains those procedures which may be considered routine in day-to-day operations. The presentation includes, but is not limited to, detailed checklist procedures by flight phase. These normal procedures are provided as guidance and should not be construed as prohibiting the operator from developing equivalent normal procedures in accordance with the applicable operating rules.

THROUGH-FLIGHT PROCEDURES (BOTH ENGINES SHUT DOWN)

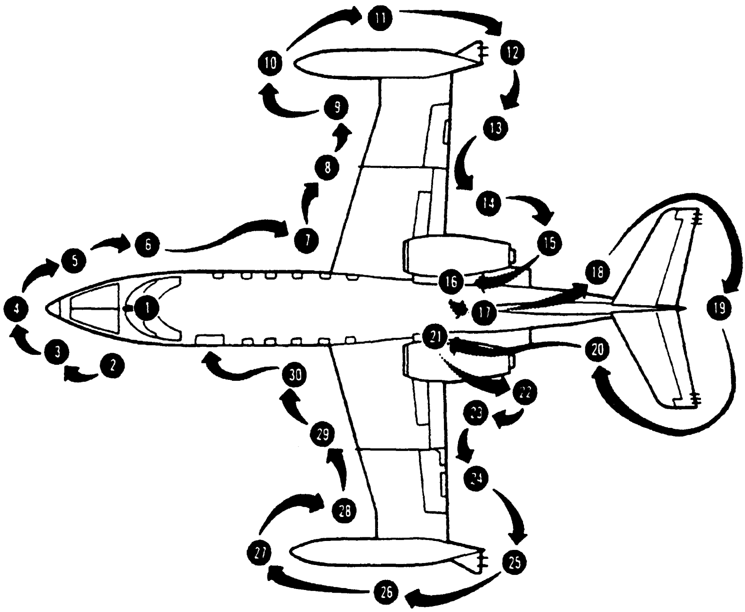
Normal preflight procedures (all checklist line items) must be accomplished prior to takeoff at the original departure point of a flight. At each intermediate stop of flight where both engines are shutdown, the Through-Flight Checklist may be used for preflight provided certain criteria are met during a stop. In the following section, procedures marked with this symbol (◆) denote Through-Flight Checklist items. When permitted, accomplishment of all Through-Flight Checklist items fulfills a minimum preflight requirement.

The Through-Flight Checklist may be used following an intermediate stop with both engines shutdown provided the following criteria have been satisfied during that stop:

- There has been no change in flight crew personnel.
- No maintenance has been performed on the aircraft. Routine line servicing is not considered maintenance.
- No more than three (3) hours have elapsed between engine shutdown and engine start.
- Extreme weather conditions (heavy precipitation, ice, snow, extreme cold, etc.) have not occurred which would change the preflight status of the aircraft.

For intermediate stops with one or no engine shut down, completion of the QUICK TURNAROUND procedure in this section provides the minimum preflight requirements.

EXTERIOR PREFLIGHT


1
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Walk-Around Inspection
Figure 2-1

EXTERIOR PREFLIGHT (CONT)

POWER OFF CHECKS

◆ During exterior inspection, check all vents clear, access doors for security, and all aircraft surfaces for condition.

① ◆ a. Controls Lock — Remove and stow.

② a. Pilot's Windshield Alcohol Discharge Outlets and Pilot's Defog Outlet — Clear of obstructions.

③ ◆ a. Left Pitot-Static Probe — Cover removed, clear of obstructions.
◆ ◆ b. Left Stall Warning Vane — Freedom of movement, leave in down position.
c. Left Pitot-Static Drain Valves (4) — Drain. Required only if moisture in the pitot-static system is known or suspected.

NOTE If pitot-static drain valves are opened, ensure that valve stem returns to the closed position.

d. Nose Gear and Wheel Well — Hydraulic leakage and condition.
◆ e. Nose Wheel and Tire — Condition and nose gear uplock forward.

NOTE Chine on nose tire must be a minimum of 3/4 inch (19 mm) from ground to operate safely with an accumulation of 3/4 inch (19 mm) water on runway surface.

④ a. Radome Alcohol Discharge Port — Clear of obstructions.
b. Radome and Radome Erosion Shoe — Condition.

⑤ a. Oxygen Bottle Supply Valve (if applicable) — Open (On).
◆ b. Right Pitot-Static Probe — Cover removed, clear of obstructions.
c. Total Temperature Probe (if installed) — Clear of obstructions.
◆ d. Right Stall Warning Vane — Freedom of movement, leave in down position.
◆ e. Pressurization Static Port — Clear of obstructions.

EXTERIOR PREFLIGHT (CONT)

f. Right Pitot-Static Drain Valves (2) — Drain. Required only if moisture in the pitot-static system is known or suspected.

NOTE

If pitot-static drain valves are opened, ensure that valve stem returns to the closed position.

g. Oxygen Discharge Disc (if applicable) — Condition.

❻ a. Copilot's Windshield Defog Outlet — Clear of obstructions.
b. Wing Inspection Light and Lens (if installed) — Condition.
c. Lower Fuselage Antennas, Rotating Beacon Light and Lens — Condition.

❼ a. Emergency Exit — Secure.
b. Upper Fuselage Antennas, Rotating Beacon Light and Lens (on vertical fin) — Condition.
◆ c. Right Engine Inlet and Fan — Clear of obstructions and condition.

WARNING

- If fan is windmilling, stop by pressing on fan spinner. Do not attempt to stop windmilling by grabbing blades.
- The wing, flight control surfaces, and engine inlet must be free of frost, snow, and ice.

d. Fuel Crossover, Left Wing Sump, Left Engine Fuel, Right Wing Sump, and Right Engine Fuel Drain Valves — Drain.
e. Right Main Gear and Wheel Well — Hydraulic/fuel leakage and condition.
f. Right Main Gear Landing Light — Condition.
◆ g. Right Main Gear Wheels, Brakes and Tires — Condition.

❽ a. Stall Strip (wing leading edge) and Stall Fence — Condition.
b. Right Wing Access Panels (underside of wing) — Check for fuel leakage.
c. Right Fuel Vent (underside of wing) — Plug removed, clear of obstructions.

❾ a. Boundary Layer Energizers — Condition.
b. Right Wing Heat Scupper (underside of wing forward) — Clear of obstructions.

❿ a. Right Tip Tank — Condition.
b. Right Tip Tank Recognition Light and Lens — Condition.

EXTERIOR PREFLIGHT (CONT)

⑪ a. Right Tip Tank Sump Drain Valve — Drain.
◆ b. Right Tip Tank Fuel Cap — Condition and secure.
c. Right Tip Tank Navigation Light, Strobe Light and Lens — Condition.

⑫ a. Right Tip Tank Fin and Static Discharge Wicks (2) — Condition.
b. Right Tip Tank Fuel Jettison Tube — Clear of obstructions.

⑬ a. Scupper (underside of right wing aft) — Clear of obstructions, no fuel leakage.
b. Right Aileron — Check free motion, balance tab linkage and brush seal condition.

⑭ a. Right Spoiler and Flap — Condition.
b. Right Engine Oil — Open access. Check oil level (normal) and oil tank filler cap for security. Secure access.

NOTE

> If preflight oil level checks low, start and run engine until stabilized at idle. Shut down engine and recheck oil level. If there is no oil level indication, add enough oil to obtain an indication before starting engine to recheck oil level.

c. Right Engine Oil Bypass Valve Indicator — Check, not extended. (If red pin indicator protrudes, investigate.)

⑮ ◆ a. Right Engine Turbine Exhaust Area — Condition, clear of obstructions.

⑯ a. Right Engine Fuel Bypass Valve Indicator — Check, not extended. (If red pin indicator protrudes, investigate.)
◆ b. Fuel Vent Drain Valve — Drain completely.
c. Transfer Line Drain Valve *(Aircraft with FUS VALVE switch)* — Drain.
d. Fuselage Tank Sump Drain Valve, Left Fuel Filter Drain Valve and Right Fuel Filter Drain Valve — Drain.

⑰ a. Tailcone Access Door — Open.
b. Tailcone Interior — Check for fluid leaks, security and condition of installed equipment.
c. Hydraulic Accumulator Pressure — Check, 750 psi minimum.
d. Drag Chute (if applicable) — Check for proper installation.
e. Tailcone Access Door — Close and secure.

EXTERIOR PREFLIGHT (CONT)

⑱
a. Right Fuel Computer Drain Valve — Drain.
b. Oxygen Discharge Disc (if applicable) — Condition.
c. Right VOR/LOC Antenna — Condition.
d. Right ELT Antenna (if applicable) — Condition.

⑲
a. Vertical Stabilizer, Rudder, Horizontal Stabilizer and Elevator — Condition, drain holes clear.

WARNING

The vertical and horizontal stabilizer, and flight control surfaces must be free of frost, snow, and ice.

b. Static Discharge Wicks (6 on elevators, 1 above nav light and 1 on ventral fin) — Condition.
c. Vertical Fin Navigation Lights, Strobe Light and Lens — Condition.
d. VLF H-Field Antenna (if applicable) — Condition.

⑳
a. Left VOR/LOC Antenna — Condition.
b. Left ELT Antenna (if applicable) — Condition.
c. Left Fuel Computer Drain Valve — Drain.

㉑
a. Fire Extinguisher Discs — Condition.
b. Left Engine Oil Bypass Valve Indicator — Check, not extended. (If red pin indicator protrudes, investigate.)

㉒ ◆
a. Left Engine Turbine Exhaust Area — Condition, clear of obstructions.

㉓
a. Left Engine Fuel Bypass Valve Indicator — Check, not extended. (If red pin indicator protrudes, investigate.)
b. Left Engine Oil — Open access. Check oil level (normal) and dipstick filler cap for security. Secure access.

NOTE

If preflight oil level checks low, start and run engine until stabilized at idle; then shut down engine and recheck oil level. If there is no oil level indication, add enough oil to obtain an indication before starting engine to recheck oil level.

c. Left Spoiler and Flap — Condition.

㉔
a. Left Aileron — Check free motion, balance and trim tabs linkage and brush seal condition.
b. Scupper (underside of left wing aft) — Clear of obstructions, no fuel leak.

EXTERIOR PREFLIGHT (CONT)

㉕
a. Left Tip Tank Fuel Jettison Tube — Clear of obstructions.
b. Left Tip Tank Fin and Static Discharge Wicks (2) — Condition.

㉖
a. Left Tip Tank Navigation Light, Strobe Light and Lens — Condition.
◆ b. Left Tip Tank Fuel Cap — Condition and secure.
c. Left Tip Tank Sump Drain Valve — Drain.

㉗
a. Left Tip Tank Erosion Shoe (or recognition light and lens if installed) — Condition.
b. Left Tip Tank — Condition.

㉘
a. Left Wing Heat Scupper (underside of wing forward) — Clear of obstructions.
b. Boundary Layer Energizers — Condition.

㉙
a. Left Wing Access Panels (underside of wing) — Check for fuel leakage.
b. Left Fuel Vent (Underside of Wing) — Plug removed, clear of obstructions.
c. Stall Strip (wing leading edge) and Stall Fence — Condition.

㉚
a. Left Main Gear and Wheel Well — Hydraulic/fuel leakage and condition.
b. Left Main Gear Landing Light — Condition.
◆ c. Left Main Gear Wheels, Brakes, and Tires — Condition.
◆ d. Left Engine Inlet and Fan — Clear of obstructions and condition.

WARNING

- If fan is windmilling, stop by pressing on fan spinner. Do not attempt to stop windmilling by grabbing blades.
- The wing, flight control surfaces, and engine inlet must be free of frost, snow, and ice.

EXTERIOR PREFLIGHT (CONT)

POWER ON CHECKS

① LANDING GEAR Switch — DN.
Both BAT Switches — On. Both PITOT HEAT Switches — On.
Fuel Quantities — Check.

③ ⑤ Use caution when touching pitot-static probes, total temperature probe (if installed), and stall warning vanes to check for heat. Set PITOT HEAT switches OFF.

⑦ ⑪ ⑳ ㉔ ㉘ If night flight is anticipated, check exterior lighting. All exterior light switches — On. Check proper illumination then all exterior light switches — Off.

① Both BAT Switches — OFF.

CABIN PREFLIGHT

◆ 1. Baggage — Secure.
2. Cabin Air Damper Control Knob or Cabin Blower Switch (on blower duct in aft cabin) — As required.

NOTE

- *On aircraft with cabin air damper control knob,* the auxiliary cabin heater will not operate unless damper control knob is in the closed position.
- *On aircraft with cabin blower switch,* when cabin blower switch (on blower duct in aft cabin) is in the OFF position, airflow is diverted above the headliner at all times except during auxiliary heater operation.

◆ 3. Emergency Exit — Aisle clear and handle unobstructed.
◆ 4. Brief passengers. Briefing to include seat belt operation, oxygen system operation, life vest location and operation, emergency evacuation, and fire extinguisher location.

NOTE

- Inform passengers that smoking in the lavatory area when the privacy curtains are closed is prohibited.
- Passengers should be advised not to use portable electronic equipment during takeoff, approach and landing.

BEFORE STARTING ENGINES

◆ 1. Controls Lock — Stowed.

◆ 2. Safety Belts, Shoulder Harnesses, and Seats — Secure and adjust.

NOTE Ensure that seat is adjusted so that full travel can be obtained on all controls.

◆ 3. Flight Controls — Check. Full travel on all controls.

NOTE Ensure that, during full rudder pedal movement, foot wear does not hinder movement of rudder pedals.

4. Oxygen System:
   a. PASS MASK Valve — AUTO.
   b. PASS OXY Valve — NORM.
   ◆ c. OXYGEN PRESSURE Gage — Check.
   d. Crew Masks:
      (1) Check oxygen flow available. Select 100% oxygen.
      (2) *On Scott ATO masks,* check harness inflation.

◆ 5. Circuit Breaker Panels — Breakers depressed.

6. LANDING GEAR Switch — DN.

7. Emergency Power System Check:
   - *Aircraft with Single Emergency Battery System.*
   a. EMER BAT Switch — STBY. Check attitude gyro for starting and erection, and amber EMER PWR light illuminated.
   b. EMER BAT Switch — On. Check attitude gyro operation and amber EMER PWR light illuminated and green gear LOCKED DN lights illuminated.
   ◆ *For thru flight,* EMER BAT Switch — On. Check attitude gyro for starting and erection.
   - *Aircraft with Dual Emergency Battery System.*
   a. EMER PWR BAT 1 Switch — STBY. Check attitude gyro for starting and erection.
   b. EMER PWR BAT 2 Switch — On. Check both amber EMER PWR lights illuminated, and equipment powered by second emergency battery for operation.
   c. EMER PWR BAT 1 Switch — On. Check attitude gyro for operation, and both amber EMER PWR lights illuminated, and green gear LOCKED DN lights illuminated.
   ◆ *For thru flight,* both EMER PWR Switches — On. Check attitude gyro for starting and erection.

◆ 8. Panel Switches and Avionics — Off or set:
   a. FUEL CMPTR Switches — ON.
   b. ANTI-SKID Switch — ON.
   c. STATIC SOURCE Switch — BOTH.
   d. BLEED AIR Switches — ON.
   e. PITCH TRIM Switch — PRI.

BEFORE STARTING ENGINES (CONT)

f. JET PUMP Switches — ON.

g. EMER PRESS Switches (if installed) — NORMAL except for takeoff above 8500 feet pressure altitude.

NOTE *Aircraft with emergency pressurization override switches installed.* For takeoff at field elevations above 8500 feet pressure altitude, refer to PRESSURIZATION SYSTEM OPERATION, this section.

9. Battery Check:

NOTE Setting battery switches On also energizes the windshield ice detect lights. Check Turbine Temperature (ITT), Fan Speed (N1), and Turbine Speed (N2) to ensure red OFF flags are retracted.

a. BAT 1 Switch — Set to BAT 1. Check for proper voltage. Amber EMER PWR light(s) will go out.

b. BAT 2 Switch — Set to BAT 2.

c. BAT 1 Switch — OFF. Check for proper voltage, then BAT 1 Switch set to BAT 1.

◆ *For thru flight,* both BAT Switches — On.

NOTE

- *On aircraft with Lead-Acid Batteries,* do not attempt a battery start with less than 24 VDC each battery at 70°F (21°C) or below, or less than 25 VDC each battery at 110°F (43°C) or above. Interpolate for temperatures between 70°F (21°C) and 110°F (43°C).

- *On aircraft with Nickel-Cadmium Batteries,* do not attempt a battery start with less than 23 VDC each battery.

◆ 10. GPU (if desired) — Connect.

NOTE Ensure unit is regulated to 28 VDC and limited to 1100 amps maximum.

11. Inverter System — Check:

a. PRI INVERTER Switch — PRI. SEC and AUX INVERTER (if installed) Switches — OFF. Check PRI INV light out and AC VOLTS reading is within green arc.

b. AC BUS Switch — PRI then SEC. Check AC VOLTS reading is within green arc in both positions.

c. SEC INVERTER Switch — SEC. Check SEC INV light out.

d. PRI INVERTER Switch — OFF. Check AC VOLTS reading is within green arc.

BEFORE STARTING ENGINES (CONT)

e. Auxiliary Inverter (if installed) — Check:
    (1) AUX INVERTER ON-OFF Switch — ON. Check AUX INV light not illuminated.
    (2) SEC INVERTER Switch — OFF. Check AC VOLTS reading is within green arc.

◆ f. PRI, SEC, and AUX INVERTER (if installed) Switches — On.

NOTE

On aircraft with auxiliary inverter, it is recommended that all three inverters be On during normal operations for maximum inverter life.

12. EMER LT Switch (if installed) — TEST; check for illumination, then switch — ARMED.

◆ *For thru flight,* EMER LT Switch (if installed) — ARMED.

◆ 13. Systems Pressure Checks:
    a. EMERGENCY AIR Pressure Gage — Check.
    b. HYDRAULIC PRESSURE Gage — Check. If pressure is below 1000 psi, HYD PUMP Switch — On.

◆ 14. PARKING BRAKE — Set. PARK BRAKE light (if installed) illuminated.

15. EMER BRAKE — Pull the handle out of the recess then return. Do not push the handle downward, as it may introduce emergency brake air into the hydraulic system.

◆ 16. HYD PUMP Switch — OFF.

17. Warning Light Test Switch (under glareshield) — Depress switch and check annunciator panel lights, MSTR WARN lights, FIRE PULL or ENG FIRE PULL T-Handle warning lights, ARMED lights, ANTI-SKID GEN lights, instrument panel annunciator lights, AIR IGN lights, Starter Engaged lights (if installed), and fuel panel lights illuminate. During daylight, check photoelectric cells by covering both cells and noting that lights dim. Alternately uncover and cover cells to ensure warning lights dim and come on full bright. During darkness, check photoelectric cells by shining flashlight on each cell and noting that lights are full bright. Then note that lights dim when light source is removed.

18. Warning System Checks:
    a. Windshield Ice Detect Lights — Check illuminated by placing an object between the lights and windshield, use care to prevent scratching windshield when checking ice detect lights.
    b. Landing Gear Lights — Check; three (3) green. Then TEST-MUTE Switch — TEST. Check horn and three (3) red UNSAFE lights illuminated.

◆ c. Fire Detect System — Check:
    (1) TEST Selector Switch — Rotate to FIRE DET.

BEFORE STARTING ENGINES (CONT)

(2) TEST Button — Depress. FIRE PULL or ENG FIRE PULL T-Handle shall illuminate and flash. This indicates continuity of the fire detect systems.

(3) TEST Button — Release.

NOTE

It is recommended that one engine be started after Step c if external power is not being used. Refer to STARTING ENGINES this section.

d. Cabin Altitude Warning — Check:

(1) TEST Selector Switch — Rotate to CABIN ALT, then depress and hold TEST button. Cabin altitude warning horn shall sound.

(2) HORN SILENCE Switch — Momentarily engage. Cabin altitude warning shall cease.

(3) TEST Button — Release.

e. Stick Puller/Mach Warning Check:

(1) PRI or SEC INVERTER Switch — PRI or SEC.

(2) Set Pitch Trim within T.O. segment on PITCH TRIM indicator.

(3) L STALL WARNING Switch — On.

(4) TEST Selector Switch — Rotate to MACH.

(5) Depress and hold TEST button. Control Column shall move aft with approximately 18 pounds force and the aural overspeed warning shall sound. After approximately 1/2 second, the puller and overspeed warning shall cease. After approximately 1/2 additional second, the puller and overspeed warning shall activate again and then cease. *On aircraft 35-067 thru 35-670 and 36-018 thru 36-063,* after approximately 1/2 additional second, the overspeed warning shall sound again.

(6) TEST Button — Release.

f. Mach Trim Check:

(1) TEST Selector Switch — Rotate to MACH TRIM.

(2) Depress and hold TEST Button. The stabilizer should trim slowly in the nose up direction for 1 to 3 seconds and then stop. The trim-in-motion audio clicker may or may not sound. The MACH TRIM warning light shall illuminate and the overspeed warning horn shall sound.

(3) TEST Button — Release. MACH TRIM warning light shall go out and overspeed warning horn shall cease.

BEFORE STARTING ENGINES (CONT)

g. Stall Warning System Check:

NOTE

> During heavy wind conditions, it may be necessary to head aircraft into the wind to prevent wind from blowing stall warning vanes up.

(1) Flaps — UP.

(2) STALL WARNING Switches — Left On; check L STALL light goes out; then Left OFF. Right On, check R STALL light goes out; then Left On.

(3) TEST Selector Switch — Rotate to L STALL, then depress and hold TEST button. The nudger monitor horn will sound for approximately one second and then the pilot's angle-of-attack indicator needle will begin to sweep from the green segment to the red segment.

(a) As the needle passes the green-yellow margin, the shaker will actuate, the nudger shall actuate, and the red L STALL warning light shall flash. Shaker actuation is made evident by high-frequency vibration of the control column. Nudger actuation is made evident by low frequency forward movement (if not opposed) of the control column.

WARNING

> The action of the nudger verifies operation of the pitch torquer prior to pusher actuation. If, during ground test, the shaker is not accompanied by the nudger (the nudger monitor horn will sound) — **do not dispatch**. If, during flight, the shaker is not accompanied by the nudger (the nudger monitor horn will sound) — **do not decelerate further**.

(b) As the needle advances to the red segment, the pusher will actuate briefly, then stop. L STALL warning light will illuminate steady just prior to or at pusher actuation. After pusher stops, the needle shall sweep back and remain in the yellow or green segment.

(4) TEST Button — Release.

(5) Rotate TEST Selector Switch to R STALL. Depress and hold TEST button. The test operation will be identical to Step (3) above except needle will sweep the copilot's angle-of-attack indicator and the red R STALL warning light will flash.

(6) TEST Button — Release.

BEFORE STARTING ENGINES (CONT)

(7) Repeat Step (5) and (6) with either control wheel master switch (MSW) depressed. Verify that, as the angle-of-attack indicator needle moves through the band, the nudger and pusher do not actuate. The nudger monitor horn will sound if the needle stays in the yellow segment.

(8) Flaps — DN. Check that both angle-of-attack indicator needles make at least one significant shift in position as the flaps are lowered.

(9) STALL WARNING Switches — OFF.

NOTE

With STALL WARNING switches On, steady illumination of the L or R STALL warning light indicates a malfunction, except during pusher actuation or system test.

◆19. Third Attitude Gyro — Uncage.

20. Pressurization and Temperature Controls — Check and set as follows:

a. Pressurization Controls:

NOTE

- For manual mode pressurization, refer to PRESSURIZATION SYSTEM OPERATION, this section.
- *Aircraft with Emergency Pressurization Override switches installed.* For takeoff at field elevations above 8500 feet pressure altitude, refer to PRESSURIZATION SYSTEM OPERATION, this section.

- *Aircraft 35-067 thru 35-112 except 35-107. Aircraft 36-018 thru 36-031.*
  (1) L and R BLEED AIR Switches — Check, On.
  (2) CABIN AIR Switch — OFF.
  (3) PRESSURIZATION AUTO-MAN Switch — AUTO.
  ◆ (4) AIRCRAFT ALT Selector Knob — Rotate to cruise altitude.
  (5) Cabin RATE Selector — Position as desired.
  (6) IN NORMAL-OUT DEFOG Knob — Push in.
- *Aircraft 35-107, 35-113 and subsequent and 36-032 and subsequent.*
  (1) L and R BLEED AIR Switches — Check, On.
  (2) CAB AIR Switch — OFF.
  (3) PRESSURIZATION AUTO-MAN Switch — AUTO.
  ◆ (4) CABIN CONTROLLER — Select cruising altitude or desired cabin altitude.
  (5) Cabin RATE Selector — Position as desired.

BEFORE STARTING ENGINES (CONT)

b. CABIN CLIMATE CONTROL Switches — As Desired.

- *Aircraft 35-067 thru 35-112 except 35-107. Aircraft 36-018 thru 36-031.*

  Automatic Mode Operation:

  (1) MAN-AUTO-HOT Knob — Rotate out of MAN detent (to AUTO) and set to desired cabin temperature. After takeoff, the cabin temperature control system will automatically maintain the cabin at the desired setting.

  Manual Mode Operation:

  (1) MAN-AUTO-HOT Knob — Rotate to MAN detent.
  (2) MAN-HOT-COLD Switch — Hold to COLD or HOT until desired setting is reached.

- *Aircraft 35-107, 35-113 and subsequent, and aircraft 36-032 and subsequent.*

  Automatic Mode Operation:

  (1) AUTO-MAN Switch — AUTO.
  (2) COLD-HOT Knob — Rotate to desired cabin temperature. After takeoff, the cabin temperature control system will automatically maintain the cabin at the desired setting.

  Manual Mode Operation:

  (1) AUTO-MAN Switch — MAN.
  (2) COLD-HOT Knob — Rotate to desired setting.

21. Trim Check:

NOTE

- The following procedure accomplishes the minimum trim systems preflight check. For the complete trim systems operational check refer to TRIM SYSTEMS OPERATIONAL CHECK in this section.
- Throughout the following procedure, verify that the trim-in-motion audio clicker sounds approximately 1/4 second after initiating pitch trim with the flaps up. The trim-in-motion audio clicker will not sound when the flaps are lowered beyond 3°.

a. Flaps — UP.
b. PITCH TRIM Selector Switch (pedestal) — SEC.
c. NOSE DN-OFF-NOSE UP Switch (pedestal) — Check operation:
  (1) Operate switch NOSE UP and NOSE DN. Trim motion shall occur in both directions.
  (2) Check that depressing either control wheel master switch (MSW) while trimming NOSE UP and NOSE DN will stop trim motion while control wheel master switch (MSW) is held.
d. PITCH TRIM Selector Switch — PRI.

BEFORE STARTING ENGINES (CONT)

e. Pilot's and Copilot's Control Wheel Trim Switches — Check individually:

- ◆ (1) Without depressing arming button, move switch NOSE UP and NOSE DN. Trim motion shall not occur.
- (2) Without depressing arming button, move switch LWD and RWD. Trim motion shall not occur.
- ◆ (3) Depress arming button and move switch NOSE UP and NOSE DN. Trim motion shall occur.
- (4) Depress arming button and move switch LWD and RWD. Trim motion shall occur.
- ◆ (5) Check that depressing either control wheel master switch (MSW) while trimming NOSE UP and NOSE DN will stop trim motion.

f. Trim Speed — Check:

- *On aircraft incorporating AAK 83-2:*
  - (1) While trimming NOSE UP or NOSE DN with either control wheel trim switch, actuate and hold TRIM OVSP-OFF-TRIM MON switch to TRIM OVSP. Amber PITCH TRIM light shall illuminate.
  - (2) TRIM OVSP-OFF-TRIM MON Switch — Release.
  - (3) Flaps — DN.
  - (4) Either Control Wheel Trim Switch — NOSE UP or NOSE DN. Verify that PITCH TRIM indicator needle moves faster with flaps down and trim-in-motion audio clicker does not sound.
- *On aircraft 35-408, 35-506 and Subsequent, 36-054 and Subsequent:*
  - (1) TEST Selector Switch — Rotate to TRIM OVSP.
  - (2) While trimming NOSE UP or NOSE DN with either control wheel trim switch, depress TEST button. Amber PITCH TRIM light shall illuminate.
  - (3) TEST Button — Release.
  - (4) Flaps — DN.
  - (5) Either Control Wheel Trim Switch — NOSE UP or NOSE DN. Verify that PITCH TRIM indicator needle moves faster with flaps down and trim-in-motion audio clicker does not sound.

g. Trim Monitor — Check:

- *On aircraft incorporating AAK 83-2:*
  - (1) TRIM OVSP-OFF-TRIM MON Switch — Actuate and hold to TRIM MON. Amber PITCH TRIM light shall illuminate.
  - (2) TRIM OVSP-OFF-TRIM MON Switch — Release.

BEFORE STARTING ENGINES (CONT)

- *On aircraft 35-408, 35-506 and Subsequent, 36-054 and Subsequent:*
  (1) TEST Selector Switch — Rotate to TRIM MON.
  (2) TEST Button — Depress. Amber PITCH TRIM light shall illuminate.
  (3) TEST Button — Release.

h. Rudder Trim Switch (pedestal) — Check operation by moving both halves of switch simultaneously to NOSE LEFT and NOSE RIGHT. Trim motion shall occur.

◆ i. Trim — Set all axes for takeoff and amber T.O. TRIM light extinguished. Refer to Figure 2-2 (TAKEOFF TRIM • CG FUNCTION) for takeoff trim setting.

22. Autopilot Monitor Check:

NOTE

- It is not required that the Attitude Director Indicator (ADI) and Horizontal Situation Indicator (HSI) flags be retracted in order to complete the autopilot monitor check.
- The following procedure accomplishes the autopilot monitor preflight check. For a complete autopilot operational check, refer to the Flight Manual Supplement for J.E.T. FC-530 Autopilot/Flight Director.

◆ a. AUTOPILOT Switch — ON. PWR annunciator on Autopilot Controller (glareshield) will illuminate.

b. TST Button (Autopilot Controller) — Depress. All annunciators on Autopilot Controller should illuminate.

◆ c. ENG and TST Buttons (Autopilot Controller) — Depress simultaneously, then release. MON, PITCH, and ROLL annunciators shall illuminate then go out and the disengage tone will sound. The ROLL annunciator will go out in approximately 8 seconds and the PITCH annunciator will go out in approximately 11 seconds. The LVL ON annunciator will illuminate when the ROLL annunciator goes out. PWR and LVL ON annunciators will remain illuminated.

NOTE

If the test fails, the failed axis (PITCH and/or ROLL) annunciator(s) will start flashing and continue to flash and the MON annunciator will remain illuminated. The failed axis annunciator(s) will continue to flash and the MON annunciator will remain illuminated until the AUTOPILOT switch is cycled. Autopilot must **not** be used in any axis which fails the autopilot monitor check. If it is intended to use autopilot with a failed axis, the failed axis DC circuit breaker (AFCS PITCH or AFCS ROLL, pilot's ess bus) must be pulled.

BEFORE STARTING ENGINES (CONT)

◆ d. *On aircraft incorporating SB 35/36-22-7,* Accelerometer Monitor — Check:
  (1) ENG Button (Autopilot Controller) — Depress. PITCH and ROLL annunciators shall illuminate.
  (2) ENG and BC Buttons (Autopilot Controller) — Depress simultaneously, then release. After a 2 to 10 second delay, the PITCH and ROLL annunciators will go out and the disengage tone will sound. Test fails if the autopilot does not disengage within the 2 to 10 second time.

NOTE Autopilot pitch axis must **not** be used if the accelerometer monitor check fails.

23. Yaw Dampers — Check as follows:
◆ a. Flaps — UP.
◆ b. PRI PWR and SEC PWR Buttons (Y/D panel on pedestal) — Depress. PRI and SEC ON annunciators will illuminate.
  c. Yaw Force Indicator — Center by rotating control wheel.
  d. TST Button (Y/D panel) — Depress and hold. PRI and SEC ENG annunciators shall illuminate and both yaw damper force indicators shall deflect right, then slowly deflect left. Release TST button.

NOTE If retesting is desired, wait at least 5 seconds for the test circuit to reset before re-engaging the TST button.

  e. SEC ENG Button — Depress. SEC ENG annunciator will illuminate.
  f. Depress first one rudder pedal and then the other while holding control wheel centered. It must be possible to depress each rudder pedal against the opposition of the yaw damper system. The yaw force indicator will indicate the direction of input.
  g. Flaps — DN.
  h. Depress first one rudder pedal and then the other while holding control wheel centered. It must be possible to depress each rudder pedal against the opposition of the yaw damper system. Note significantly lower rudder pedal force required to overpower yaw damper. The yaw force indicator will indicate the direction of input.
  i. Control Wheel — Rotate to full left, rudder pedals will deflect to the left. Then rotate Control Wheel full right, rudder pedals will deflect to the right.
  j. SEC ENG Button — Depress. SEC ENG annunciator will extinguish and yaw damper will disengage. Disengage aural tone will sound.

BEFORE STARTING ENGINES (CONT)

k. PRI ENG Button — Depress. PRI ENG annunciator will illuminate. Depress first one rudder pedal and then the other while holding control wheel centered. It must be possible to depress each rudder pedal against the opposition of the yaw damper system. The yaw force indicator will indicate the direction of input.

l. Control Wheel — Rotate to full left, rudder pedals will deflect to the left. Then rotate control wheel full right, rudder pedals will deflect to the right.

m. Control Wheel Master Switch (MSW) — Depress. PRI ENG annunciator will extinguish and yaw damper will disengage. Disengage aural tone will sound.

24. Fuel Panel:
    - ◆ a. Fuel Counter — Zero.
    - ◆ b. Fuel Quantities — Check.
    - ◆ c. CROSSFLOW Switch — CLOSE.
    - ◆ d. FUS TANK XFER-FILL Switch — OFF.
    - e. L STANDBY PUMP Switch — ON. Check annunciator in switch (if applicable) illuminated and L FUEL PRESS light (red) not illuminated.
    - f. L STANDBY PUMP Switch — Off. Check annunciator in switch (if applicable) extinguishes.
    - g. R STANDBY PUMP Switch — ON. Check annunciator in switch (if applicable) illuminated and R FUEL PRESS light (red) not illuminated.
    - h. R STANDBY PUMP Switch — Off. Check annunciator in switch (if applicable) extinguishes.
    - ◆ i. FUS VALVE Switch (if installed) — CLOSE.
    - j. FUEL JTSN Switch — Off.
25. CVR — Test.
26. ◆ DRAG CHUTE Handle (if installed) — Stowed.
27. ◆ Takeoff Data (N_1, V_1, V_R, V_2, Takeoff Distance) — Computed and bugs set (Refer to Section V).

TAKEOFF TRIM • CG FUNCTION

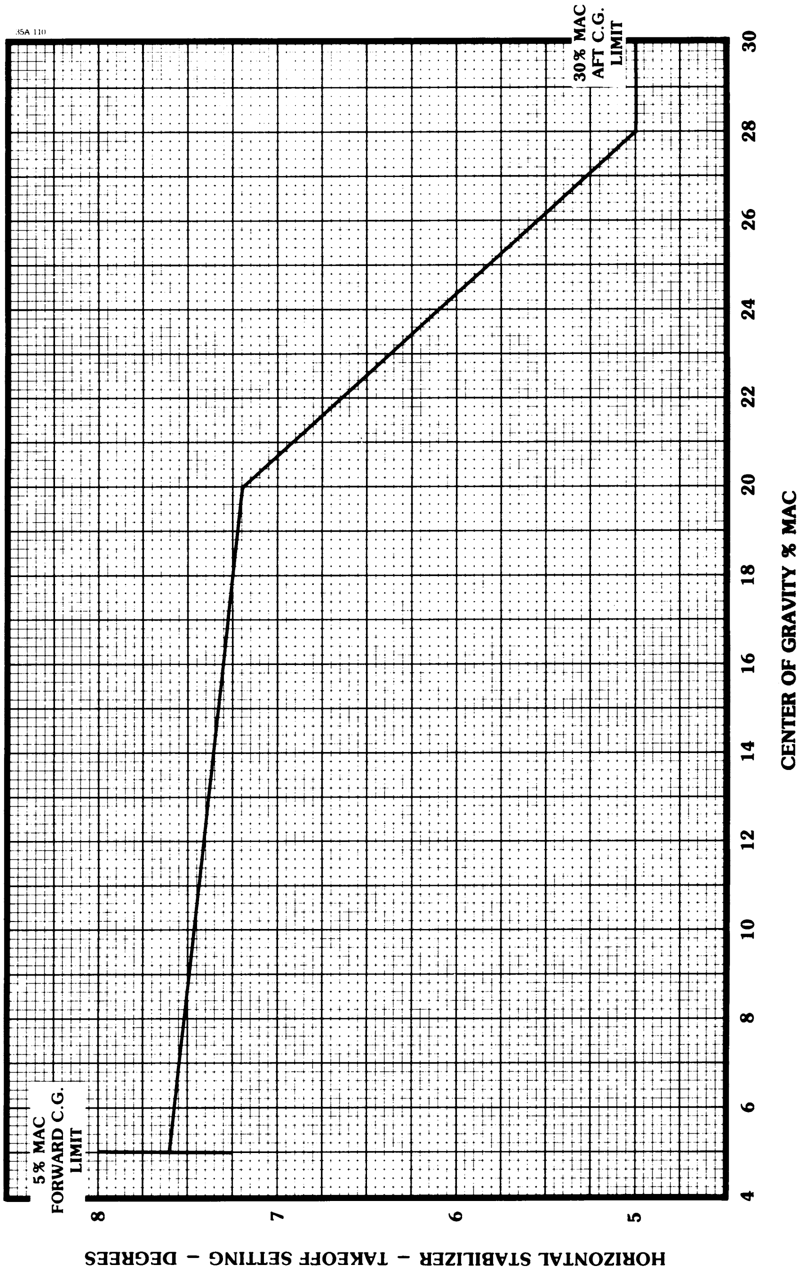

Figure 2-2

STARTING ENGINES

It is recommended that a GPU be used when ambient temperature is 32°F (0°C) or below. Ensure GPU supply is regulated to 28 VDC, has adequate capacity for engine starting and is limited to 1100 amps maximum.

WARNING

Airflow into the TFE 731 engine is sufficient to draw personnel and equipment into the engine inlet. Personnel in proximity of the engine inlet should maintain a safe distance at all times during engine operation.

CAUTION

On aircraft equipped with Nickel-Cadmium batteries, **do not dispatch** if red BAT 140 or BAT 160 warning light comes on at any time prior to takeoff, including engine start. Check batteries per Learjet Maintenance Manual.

◆ 1. Cabin Door — Closed and locked.
    a. Both Door Handles — Forward.
    b. DOOR Light (red) — Not illuminated.
2. L and R FUEL CMPTR Switches — On. Check L and R FUEL CMPTR lights — Out.
◆ 3. COOL-FAN Switch — OFF or FAN.
◆ 4. AUX HT Switch (if installed) — OFF.
◆ 5. Batteries — Check for minimum voltage.
◆ 6. PRI INVERTER Switch — On.
◆ 7. PARKING BRAKE (hydraulic pressure required) — Set.
◆ 8. HYD PUMP Switch — OFF.
◆ 9. BCN LT Switch — On.
10. Thrust Levers — CUTOFF.
◆ 11. Engine — Start:
    a. START-GEN Switch — START. Red starter engaged light (if installed) will illuminate.
    b. Thrust Lever (at N_1 rotation and 10% N_2) — IDLE. AIR IGN light will illuminate.
    c. If temperature is 0°F or below, SPR Switch — L or R depending on engine being started. Release switch at 300°C – 400°C Turbine Temperature (ITT). Use of SPR switch is not required at temperatures above 0°F.

NOTE

Do not energize SPR switch at any time other than engine start.

STARTING ENGINES (CONT)

d. Monitor the following:
  - (1) Fan Speed (N_1) — Increasing as Turbine Speed (N_2) increases.
  - (2) Turbine Temperature (ITT) — Max. 860°C.
  - (3) OIL PRESS — Indication within 10 seconds.
  - (4) Fuel Flow.

e. At approximately 45% or 50% Turbine Speed (N_2), the starter will automatically disengage. Check:
  - (1) AIR IGN Light — Out.
  - (2) Starter Engaged Light (if installed) — Extinguished. If starter engaged light remains illuminated, refer to STARTER ENGAGED LIGHT REMAINS ILLUMINATED AFTER START, Section IV.

NOTE

If engine does not start, adhere to the following cooling periods between starting attempts.

After Start Attempt	Wait
1	One Minute
2	One Minute
3	Fifteen Minutes
4	One Minute
5	One Minute
6	One Hour

The above cycle may then be repeated.

◆ 12. START-GEN Switch — GEN at Idle.

NOTE

On aircraft 35-067 thru 35-147 and 36-018 thru 36-035, set BAT 1 or BAT 2 switch to OFF prior to setting the START-GEN switch to GEN. Prior to starting the second engine or, in the case of single engine taxi, when ammeter reads less than 175 amps — Both battery switches — On.

◆ 13. DC VOLTS and AMPS — Check generator output.

14. Spoileron/Spoiler Check:
  - a. Flaps — Check, DN.
  - b. Control Wheel — Center.
  - c. SPOILERON RESET Switch — Hold On. Rotate control wheel. AUG AIL light will illuminate. Release SPOILERON RESET switch.
  - d. Control Wheel — Center.

STARTING ENGINES (CONT)

- e. SPOILERON RESET Switch — Hold On. AUG AIL light will extinguish. Rotate control wheel in the opposite direction. AUG AIL light will illuminate. Release SPOILERON RESET switch.

NOTE Control wheel movement to cause AUG AIL light to illuminate should be approximately the same in both directions.

- f. Control Wheel — Center.
- g. SPOILERON RESET Switch — On and release. AUG AIL light will extinguish.
- h. Control Wheel — Rotate left then right. Note that spoiler movement coincides with aileron movement and AUG AIL light remains extinguished.
- i. SPOILER Switch — EXT. Check that spoilers extend fully and symmetrically in approximately 1 to 2 seconds. SPOILER light will flash.
- j. Flaps — UP. SPOILER light will go steady.
- k. SPOILER Switch — RET. Check that spoilers retract fully and symmetrically in approximately 6 seconds and SPOILER light goes out.

◆ 15. Flaps — Set 20° or 8°.

◆ 16. HYDRAULIC PRESSURE — Check. Check LO HYD light (if installed) not illuminated.

◆ 17. Engine Instruments — Check for normal indications.

- a. At Turbine Speed (N2) Idle of 55% to 62% — Check Fan Speed (N1) 26% to 32%.
- b. OIL PRESS — Check, applicable red L or R LO OIL light extinguished.

NOTE

- *On aircraft with a single red LO OIL PRESS or OIL PRESS light,* the light will remain illuminated until both engines are operating.
- *On aircraft with red L and R LO OIL lights,* the applicable light will extinguish.

- c. FUEL PRESS Light — Check, not illuminated. This indicates JET PUMPS are operating.

NOTE For normal operations, JET PUMP switches should always be in the ON position. However, if for some reason, either or both switches are noted to be Off, reset to ON during steady engine operation at 80%, or above, Fan Speed (N1).

STARTING ENGINES (CONT)

◆ 18. Start other engine (Optional) by repeating step 11.
◆ 19. START-GEN Switch — GEN at idle.
◆ 20. Engine Instruments — Check for normal indications on both engines.
◆ 21. GPU (if applicable) — Disconnect.
◆ 22. CUR LIM Light(s) (if installed) — Out.

CAUTION

- *If AMK 80-17 or AAK 81-1 is installed on aircraft 35-067 thru 35-389 except 35-370 and 36-018 thru 36-047,* illumination of the amber L or R CUR LIMITER light indicates that the associated 275-amp current limiter(s) has failed. Replace 275-amp current limiter(s) prior to takeoff.
- *On aircraft 35-370, 35-390 & subsequent and aircraft 36-048 & subsequent,* illumination of the red CUR LIM light indicates that one or both 275-amp current limiters has failed. Replace 275-amp current limiter(s) prior to takeoff.

◆ 23. *On aircraft 35-067 thru 35-389 except 35-370; 36-018 thru 36-047, except aircraft incorporating AMK 80-17 or AAK 81-1,* Starter Disengagement — After both engines are operating, check as follows:
  a. COOL FAN Switch — OFF.
  b. AUX HT Switch — OFF.
  c. Battery Switches — OFF.
  d. AMPS — Check total current indication of less than 100 amps.
    - If total current is greater than 100 amps, shut down engines.

CAUTION

A total ammeter indication greater than 100 amps indicates that a starter has not disengaged and subsequent starter and/or engine damage may occur.

- If total current indication is less than 100 amps, set both battery switches On.

◆ 24. DC VOLTS and AMPS — Check generator output.

BEFORE TAXI

NOTE

After start, **do not** turn on air conditioner or auxiliary heater until one of the following conditions are met.

1. Each ammeter reads below 250 amps with both engines operating.
2. - *On aircraft 35-067 thru 35-147 and 36-018 thru 36-035,* one ammeter reads below 200 amps with one engine operating.
   - *On aircraft 35-148 and subsequent and 36-036 and subsequent,* one ammeter reads below 150 amps with one engine operating.

◆ 1. Avionics — Set as desired.
◆ 2. Radar — Standby.
◆ 3. Circuit Breakers — Check, in.
◆ 4. Coffee/Oven Switches (if installed) — As required.
5. Fuel Control Governor Check:
   a. Left Thrust Lever — IDLE.

CAUTION

If the engine accelerates uncontrolled during the following step, set FUEL CMPTR switch On until engine stabilizes at idle. Shut down engine and determine and correct cause prior to flight.

   b. L FUEL CMPTR Switch — OFF. Note L FUEL CMPTR light illuminated (engine RPM may increase or decrease slightly).

CAUTION

If turbine speed does not respond during the following steps, shut down engine and determine and correct cause prior to flight.

   c. Once RPM stabilizes, gradually advance thrust lever until an increase in Turbine Speed (N2) is observed.
   d. Retard thrust lever and note decrease in Turbine Speed (N2).
   e. If Turbine Speed responds to thrust lever changes, L FUEL CMPTR switch On and note that L FUEL CMPTR light is out.
   f. Repeat steps a. thru e. using R FUEL CMPTR switch and right thrust lever.

◆ 6. Purge Windshield Heat system of possible moisture accumulation (first flight of day and if exposed to moisture):
   - *Aircraft 35-067 thru 35-112 except 35-107, 36-018 thru 36-031:*
     a. IN NORMAL OUT DEFOG Knob — Pull out.
     b. WSHLD HEAT-MAN-AUTO Switch — AUTO until water has cleared.
     c. WSHLD OV HT Light — Monitor.

BEFORE TAXI (CONT)

  d. WSHLD HEAT AUTO MAN Switch — MAN.
  e. WSHLD HEAT ON-OFF Switch — OFF until airflow stops.
  f. IN NORMAL OUT DEFOG Knob — Push in.

- *Aircraft 35-107, 35-113 and subsequent and 36-032 and subsequent:*
  a. WSHLD HEAT-ON-OFF Switch — ON until water has cleared.
  b. WSHLD OV HT Light — Monitor.
  c. WSHLD HEAT-ON-OFF Switch — OFF.

◆ 7. Lights — ON, as required.

NOTE Do not use strobe lights when taxiing in vicinity of other aircraft. Position lights to be turned on for all night operations.

◆ 8. ANTI-SKID Switch — On. Check ANTI-SKID GEN Lights — Out.
◆ 9. Cabin Check:
  a. Passengers — Briefed.
  b. Swivel Seats — Forward or as placarded. Seat backs in upright and locked position.
  c. Work Tables and Toilet Door — Check stowed.
  d. Emergency Exit — Aisle clear and handle unobstructed.
◆ 10. NO SMOKING FASTEN SEAT BELT Switch — On.
◆ 11. PARKING BRAKE — Release. Check PARK BRAKE light (if installed) Out.

TAXI AND BEFORE TAKEOFF

◆ 1. Throughout taxi:

a. Nose Wheel Steering — As required.

NOTE

- Nose wheel steering may be locked in by depressing the STEER LOCK switch. The STEER ON light will illuminate. The steer lock may be disengaged at any time by depressing and releasing the pilot's or copilot's control wheel master switch (MSW). Yaw Damper will not engage or will disengage whenever nose wheel steering system is engaged.
- The PITCH TRIM light will illuminate whenever either control wheel master switch (MSW) is depressed.

b. Brakes — Check.

NOTE

When taxiing through slush or snow, use the brakes to create some friction heat in the brake discs to prevent brakes from freezing.

◆ 2. Fuel Balance — Check.
3. Flight Controls — Check.
◆ 4. Flight Instruments — Check.
◆ 5. Takeoff Data (N_1, V_1, V_R, V_2) — Reviewed and Bugs Set.
◆ 6. Start Opposite Engine (if applicable) — Refer to STARTING ENGINES, this section.
◆ 7. Engine Instruments — Check for normal indication.
◆ 8. Starter Disengagement Check (if second engine is started during taxi) — Perform. Refer to STARTING ENGINES, this section.
◆ 9. Battery Charging Bus Current Limiter Check (after both engines are started):

CAUTION

Failure to successfully complete the following checks indicates a malfunction. Replace 275-amp current limiter(s) prior to takeoff.

- *Aircraft 35-067 thru 35-147 and aircraft 36-018 thru 36-035, except aircraft incorporating AMK 80-17 or AAK 81-1:*

a. MAIN BUS TIE Circuit Breaker (copilot's main bus) — Pull.
b. One START GEN Switch — OFF. Check ammeter reading on opposite generator increases (approximately doubles), then switch back to GEN.
c. Opposite START GEN Switch — OFF. Check ammeter reading on opposite generator increases (approximately doubles), then switch back to GEN.
d. MAIN BUS TIE Circuit Breaker (copilot's main bus) — Reset.

TAXI AND BEFORE TAKEOFF (CONT)

- *Aircraft 35-148 thru 35-389 except 35-370 and aircraft 36-036 thru 36-047, except aircraft incorporating AMK 80-17 or AAK 81-1:*
  a. TEST Selector Switch — Rotate to L CUR LIM.
  b. TEST Button — Depress. Green current limiter light will illuminate and remain on while button is held. The light indicates continuity through the left current limiter. Also the L GEN light will come on and the right generator voltage may be reduced by approximately 2 VDC.
  c. TEST Selector Switch — Rotate to R CUR LIM.
  d. TEST Button — Depress. Green current limiter light will illuminate and remain on while button is held. The light indicates continuity through the right current limiter. Also the R GEN light will come on and the left generator voltage may be reduced by approximately 2 VDC.
- *Aircraft 35-067 thru 35-389 except 35-370 and 36-018 thru 36-047 incorporating AMK 80-17 or AAK 81-1:*
  a. L CUR LIMITER and R CUR LIMITER Lights — Check extinguished.
- *Aircraft 35-370, 35-390 & subsequent and aircraft 36-048 & subsequent:*
  a. CUR LIM Light — Check extinguished.

10. Fuel Control Governor Check (if second engine is started during taxi) — Perform. Refer to BEFORE TAXI, this section.
◆ 11. Voltmeters and Ammeters — Check.
◆ 12. Navigation Equipment — Set for takeoff.
◆ 13. Radar — As required.
◆ 14. Spoilers — Retracted and SPOILER light out.
◆ 15. Flaps — Set 20° or 8°, check indication.
◆ 16. Trim — Set for takeoff. Check PITCH TRIM switch in PRI and T.O. TRIM light out.
◆ 17. Pressurization System — Set.
◆ 18. CABIN AIR or CAB AIR Switch — NORM or ON.
◆ 19. CABIN CLIMATE CONTROL Switches — Set.

TAXI AND BEFORE TAKEOFF (CONT)

20. Anti-Ice Systems:

WARNING The wings, vertical and horizontal stabilizers, flight control surfaces, and engine inlets must be free of frost, snow, and ice.

NOTE

- Anti-ice systems should be turned on prior to flight into visible moisture and Outside Air Temperature of 40°F (4.4°C) or below.
- If anti-ice systems are required during takeoff, they should be turned On prior to setting takeoff power.

◆ a. Windshield Heat — As required.

NOTE Maintain minimum RPM required to keep windshield clear.

b. NAC HEAT Switches — ON one at a time. Check amber ENG ICE lights extinguish by 60% Fan Speed (N1).

◆ c. NAC HEAT Switches — As required.

d. STAB WING HEAT Switch — On. Check for slight up rate on Cabin Climb Indicator.

◆ e. STAB WING HEAT Switch — As required. Monitor WING TEMP and STAB TEMP indicators to prevent overheat condition.

◆21. *Aircraft 35-671 & subsequent and 36-064 & subsequent,* WSHLD DEFOG Switch — ON.

NOTE The L and R WSHLD DEFOG lights will illuminate upon initial activation of the windshield defog system and remain illuminated until windshield temperature reaches 80°F.

◆22. Crew Takeoff Briefing — Complete.

RUNWAY LINEUP

◆ 1. Parking Brake — Released. Check PARK BRAKE light (if installed) — Out.

◆ 2. Transponder — On.

3. Pitot Heat — Check PITOT HEAT light(s) (if installed) then On:
   - *On aircraft equipped with Single PITOT HEAT light:*
     a. L PITOT HEAT Switch — On. Note that PITOT HEAT light remains illuminated, then L PITOT HEAT Switch — OFF.
     b. R PITOT HEAT Switch — On. Note that PITOT HEAT light remains illuminated.
     c. L PITOT HEAT Switch — On. Check PITOT HEAT light goes out.
   - *On aircraft equipped with L and R PITOT HEAT lights:*
     a. L PITOT HEAT Switch — On. Note that L PITOT HEAT light goes out.
     b. R PITOT HEAT Switch — On. Note that R PITOT HEAT light goes out.

◆ *For thru flight,* both PITOT HEAT Switches — On. Check PITOT HEAT light(s) (if installed) out.

◆ 4. STROBE LT and RECOG LT Switches — On.

NOTE Do not use strobe lights during flight through fog or clouds.

◆ 5. LDG LT-TAXI Switches — On as desired.

◆ 6. STALL WARNING Switches — On.

NOTE In a strong crosswind, it may be necessary to wait until indication of airspeed is achieved before setting STALL WARNING switches On.

◆ 7. AIR IGN Switches — On.

◆ 8. Annunciator Panel and Warning Lights — Lights not illuminated, except L and R STALL lights, STEER ON light, NAC HEAT light(s) (if installed and NAC HEAT switch(es) On) and PITCH TRIM light (if control wheel master switch [MSW] is depressed).

TAKEOFF

◆ 1. Nose Wheel Steering — As required for heading control. Release at first indication of airspeed.

AFTER TAKEOFF

WARNING

When the fuel quantity gage indicates 600 pounds or less remaining in either wing tank, prolonged nose up attitude of 10° or more may cause fuel to be trapped in the aft area of the wing tank outboard of the wheel well. Fuel starvation and engine flameout may occur. Reducing pitch attitude and thrust to a minimum required will prevent this situation.

NOTE

- JET PUMP Switches should always be in the ON position. However, at any time during flight, if either or both switches are noted to be in the Off position, reset to ON during steady engine operation at 80% Fan Speed (N1), or above.
- If taxi and/or takeoff were on ice, snow, or slush, allow the wheels to spin down for approximately one minute prior to gear retraction to throw off as much slush as possible.

1. LANDING GEAR Switch — UP. Landing gear should be fully retracted prior to retracting flaps.
2. Yaw Damper PRI or SEC ENG Button — Depress.
3. Flaps — UP prior to V_{FE}.
4. Anti-Ice Systems — As required.

WARNING

Even small accumulations of ice on the wing leading edge can cause aerodynamic stall prior to activation of the stick shaker and/or pusher. These ice accumulations can also cause angle-of-attack indicator information to be unreliable.

NOTE

Anti-ice systems should be turned on prior to flight into visible moisture and Ram Air Temperature of 10°C or below.

5. AIR IGN Switches — OFF unless ambient conditions require ignition to remain On.

NOTE

During periods of heavy precipitation, set AIR IGN Switches On to prevent possible engine flameout due to large quantities of water entering the engine.

AFTER TAKEOFF (CONT)

6. Pressurization System:

NOTE

- For manual mode pressurization, refer to PRESSURIZATION SYSTEM OPERATION, this section.
- *Aircraft with emergency pressurization override switches installed.* For takeoff at field elevations above 8500 feet pressure altitude, refer to PRESSURIZATION SYSTEM OPERATION, this section.

    a. Cabin Altitude and Cabin Climb Indicators — Monitor.
    b. Cabin RATE Selector — As desired.
7. LDG LT-TAXI Switches — OFF.
8. HYDRAULIC PRESSURE — Check, normal.
9. ANGLE-OF-ATTACK Indicators — Cross-check pilot's and copilot's instruments for relative agreement.

CLIMB

10,000 Ft Checks:

1. NO SMOKING FASTEN SEAT BELT Switch — As required.

18,000 Ft (or Transition Altitude) Checks:

1. Altimeter — Set to 29.92" Hg (1013 mb) at transition altitude.
2. RECOG LT Switch — OFF.
3. COOL-FAN Switch — FAN or OFF at or before FL 180 (if applicable). Refer to FREON COOLING SYSTEM, Section I.
4. Crew Masks — Positioned to quick donning position at or before FL 250. Refer to OXYGEN SYSTEM, Section I. On aircraft with ZMR 100 series diluter-demand crew masks, check 100% OXY selected.
5. EMER PRESS Switches (if installed) — NORMAL.

FL 350 Checks:

1. COOL-FAN Switch — FAN or OFF. Refer to FREON COOLING SYSTEM, Section I.

FL 410 Checks:

Aircraft 35-067 thru 35-112 except 35-107, 36-018 thru 36-031.

1. Crew and Passenger Oxygen Masks — Don above Flight Level 410. Ensure lanyards have been pulled.

CRUISE

Once established at cruise altitude, crew duties consist mainly of monitoring aircraft systems indications and annunciators to ensure proper operation. Monitor pressurization and engine instruments. Monitor fuel distribution and crossflow fuel as required to maintain wings balanced. Use small thrust adjustments as necessary to maintain desired cruise Mach.

DESCENT

1. Windshield Heat — As required.
2. *Aircraft 35-671 & subsequent and 36-064 & subsequent,* WSHLD DEFOG Switch — Check on.
3. Windshield Aux Defog Heat (if installed) — As required.
4. Pressurization — Set as follows:

NOTE

- For manual mode pressurization, refer to PRESSURIZATION SYSTEM OPERATION, this section.
- *Aircraft with emergency pressurization override switches installed.* For landing at field elevations above 8500 feet pressure altitude, refer to PRESSURIZATION SYSTEM OPERATION, this section.
- Maintain sufficient RPM, especially at high altitudes, to maintain cabin pressurization.

   a. CABIN ALT Selector Knob — Turn to destination field elevation.
   b. Cabin RATE Selector — Adjust as desired during descent.
5. Anti-ice Systems — As required.

WARNING

Even **small** accumulations of ice on the wing leading edge can cause aerodynamic stall prior to activation of the stick shaker and/or pusher. These ice accumulations can also cause angle-of-attack indicator information to be unreliable.

NOTE

Anti-ice systems should be turned on prior to flight into visible moisture and Ram Air Temperature of 10°C or below.

FL 180 (or Transition Level) Checks:

1. Barometric Altimeters — Set to field barometric pressure at transition altitude. Cross-check pilot's and copilot's instruments.
2. RECOG LT Switch — ON.
3. Cabin Altitude and Cabin Climb Indicators — Check.
4. NO SMOKING FASTEN SEAT BELT Switch — On.
5. Cabin Check:
   a. Swivel Seats — Forward or as placarded.
   b. Work Table and Toilet Doors (if installed) — Check stowed.
   c. Emergency Exit — Check aisle clear and handle unobstructed.

APPROACH

1. Circuit Breakers — Check in.
2. HYDRAULIC PRESSURE and EMERGENCY AIR Pressure — Check.
3. Landing Approach Speed (VREF), Approach Climb Speed (approximately VREF + 7), and N1 for Go-Around — Computed and bugs set. Refer to Section V.

NOTE

It is recommended that if turbulence is anticipated due to gusty winds, wake turbulence, or wind shear, the approach speed be increased. For gusty wind conditions, an increase in approach speed of one half the gust factor is recommended.

4. Fuel Balance — Check.
5. Avionics:
   a. Avionics Equipment — Set for approach.
   b. Radio Altimeter — Set to approach minimums.
   c. Crew Approach Briefing — Complete.

BEFORE LANDING

1. SPOILER — Check RET.
2. Flaps — As desired (8°/20°).
3. LANDING GEAR Switch — DN at V_{LO} or less. Check for green LOCKED DN indication.

NOTE

- If taxi and/or takeoff were on ice, snow or slush; ANTI-SKID Switch — OFF, pump brakes 6 to 10 times, then ANTI-SKID Switch — On. Brake application will tend to crack any ice between brake discs and between the discs and wheels.
- The ENG SYNC light will illuminate whenever the nose gear is down and the ENG SYNC switch is in the SYNC position.

4. LDG LT-TAXI Switches — As required.

NOTE

The left landing light will not illuminate unless the left main gear is down and locked. The right landing light will not illuminate unless the right main gear is down and locked.

5. ANTI-SKID Switch — On. ANTI-SKID GEN Lights — Out.
6. ENG SYNC Switch — OFF.
7. Flaps — DN.
8. HYDRAULIC PRESSURE Gage — Check, normal.
9. AIR IGN Switches — On.
10. Autopilot — Disengage.

NOTE

- Use control wheel trim switch to disengage autopilot. Control wheel master switch (MSW) will also disengage yaw damper.
- At touchdown the yaw damper will disengage and the yaw damper disengage tone will sound.

GO AROUND

WARNING

When the fuel quantity gage indicates 600 pounds or less remaining in either wing tank, prolonged nose-up attitude of 10° or more may cause fuel to be trapped in the aft area of the wing tank outboard of the wheel well. Fuel starvation and engine flameout may occur.

For go-around conditions with low fuel, on first steady indication by the LOW FUEL warning light, reduce climb attitude and thrust to a minimum required.

1. Autopilot — Disengaged.

NOTE

Depressing Go-Around button in left thrust lever handle will disengage autopilot and select flight director go-around mode.

2. Thrust Levers — Set to takeoff power or as required.
3. SPOILER Switch — Check RET.
4. Flaps — 20°.
5. LANDING GEAR Switch — UP after positive rate of climb is established.
6. Climb at Approach Climb Speed.
7. When clear of obstacles, accelerate to VREF +30 and retract flaps.

LANDING

1. SPOILER Switch — EXT after touchdown.

CAUTION

If, upon touchdown, one or more ANTI-SKID GEN lights come on, anti-skid protection for the associated wheel is inoperative and has reverted to manual brake control.

2. Brakes — As required.

CAUTION

If not already operating, **do not** turn on cooling system during landing with anti-skid system operating. Initial voltage drop may cause false signals in the anti-skid system and dump brake pressure for 2 to 3 seconds.

3. Thrust Reversers or Drag Chute (if installed) — As desired.
4. Nose Wheel Steering — As required below 45 knots.

NOTE

During moderate to heavy braking action on patchy snow or ice, avoid use of nose wheel steering above 10 knots.

AFTER LANDING/CLEARING RUNWAY

1. STALL WARNING Switches — OFF.
2. AIR IGN Switches — OFF.
3. CABIN AIR or CAB AIR Switch — OFF.
4. *Aircraft 35-671 & subsequent and 36-064 & subsequent,* WSHLD DEFOG Switch — As required.
5. Anti-Ice Systems:
   - a. PITOT HEAT Switches — OFF.
   - b. Windshield and Radome Alcohol — OFF.
   - c. Windshield Heat and Windshield Aux Defog Heat (if applicable) — As required.

NOTE Maintain minimum RPM required to keep windshield clear.

   - d. NAC HEAT Switches — As required.
   - e. STAB WING HEAT Switch — As required. Monitor WING TEMP and STAB TEMP Indicators to prevent overheat condition.

6. LDG LT-TAXI Lights and RECOG LT — As desired.

NOTE Do not use strobe lights when taxiing in the vicinity of other aircraft. Navigation lights should be on for all night operations.

7. Thrust Lever (on engine started first) — CUTOFF (optional).

NOTE Idle engine for 2 minutes prior to thrust lever cutoff.

8. SPOILER Switch — RET.
9. Flaps — UP.
10. HYDRAULIC PRESSURE Gage — Check.
11. Unnecessary Avionics — OFF.
12. Transponder — Standby or Off.

SHUTDOWN

1. PARKING BRAKE and/or Chocks — Set.
2. *Aircraft 35-671 & subsequent and 36-064 & subsequent,* WSHLD DEFOG Switch — OFF.
3. Anti-Ice Systems — OFF.
4. EMER LT Switch (if installed) — DISARM.
5. All Switches (including Avionics) — OFF except FUEL CMPTR, ANTI-SKID, BLEED AIR, JET PUMPS, and PITCH TRIM.
6. Third Attitude Gyro — Cage.
7. EMER BAT or EMER PWR Switch(es) — OFF.
8. Coffee and Oven Switches (if installed) — Off.
9. Thrust Lever(s) — CUTOFF.
10. START-GEN Switches — OFF.
11. INVERTER Switches — OFF.
12. Fuel Transfer — OFF.
13. CROSSFLOW Valve — CLOSE.
14. *On aircraft 35-067 thru 35-644 and 36-018 thru 36-058 when SB 35/36-32-4 has* ***not*** *been accomplished,* Hydraulic Pressure – Bleed to zero (0).

CAUTION Failure to bleed hydraulic pressure from the system before setting the battery switches OFF could result in nose gear retraction if the landing gear selector valve malfunctions.

NOTE If the parking brake is set, use of flaps to bleed hydraulic system pressure will not affect parking brake pressure.

15. BCN LT Switch — OFF.
16. Battery Switches — OFF.
17. Controls Lock — Install.

QUICK TURNAROUND (ONE OR NO ENGINE SHUTDOWN)

1. Cabin Door — Closed and locked. DOOR light out.
2. COOL-FAN Switch — OFF or FAN.
3. AUX HT Switch (if installed) — OFF.
4. Engine — Start (2 running).
5. START GEN Switches — GEN.
6. DC VOLTS and AMPS — Check generator output.
7. If engine has been restarted.
   - *On aircraft 35-067 thru 35-389 except 35-370 and 36-018 thru 36-047 not incorporating AMK 80-17 or AAK 81-1:*
     a. Starter Disengagement Check — Perform. Refer to STARTING ENGINES, this section.
     b. Battery Charging Bus Current Limiter Check — Perform. Refer to TAXI AND BEFORE TAKEOFF, this section.
   - *On aircraft 35-370, 35-390 and subsequent, aircraft 36-048 and subsequent, and prior aircraft incorporating AMK 80-17 or AAK 81-1:*
     a. Starter Engaged and CUR LIM Light(s) — Out.
8. Circuit Breakers — In.
9. Avionics — As required.
10. Coffee/Oven Switches (if installed) — As required.
11. Anti-ice Systems — As required.

WARNING

The wings, vertical and horizontal stabilizers, flight control surfaces, and engine inlets must be free of frost, snow, and ice.

NOTE

- Anti-ice systems should be turned on prior to flight into visible moisture and Outside Air Temperature of 40°F (4.4°C) or below.
- If anti-ice systems are required during takeoff, they should be turned On prior to setting takeoff power.

12. *Aircraft 35-671 & subsequent and 36-064 & subsequent,* WSHLD DEFOG Switch — ON.

NOTE

The L and R WSHLD DEFOG lights will illuminate upon initial activation of the windshield defog system and remain illuminated until windshield temperature reaches 80°F.

13. Cabin Check:
    a. Passengers — Briefed.
    b. Swivel Seats — Forward or as placarded. Seat backs in upright and locked position.

QUICK TURNAROUND (CONT)

   c. Work Tables and Toilet Door — Check stowed.
   d. Emergency Exit — Aisle clear and handle unobstructed.

14. NO SMOKING FASTEN SEAT BELT Switch — On.

TAXI AND BEFORE TAKEOFF

1. Fuel Panel — Check.
2. Takeoff Data (N_1, V_1, V_R, V_2, Takeoff Distance) — Compute; Bugs — Set. Refer to Section V.
3. Nav Equipment — Set.
4. Radar — As required.
5. Flight Controls — Check.
6. Flight Instruments — Check.
7. Spoilers — Retracted and SPOILER light out.
8. Flaps — Set 20° or 8°, check indication.
9. Trim — Set for takeoff. Check PITCH TRIM switch in PRI and T.O. TRIM light out.
10. Pressurization — Select cruising altitude or desired cabin altitude.
11. CABIN AIR or CAB AIR Switch — NORM or ON.
12. Crew Takeoff Briefing — Complete.
13. Go to RUNWAY LINEUP, this section.

COLD WEATHER OPERATION

Operational problems related to cold weather may occur unless proper preflight and inspection procedures are accomplished. Additionally, operational difficulties due to ice, snow, slush or water accumulation may be encountered. The following instructions supplement the normal procedures and, when followed, will help ensure satisfactory operation of the aircraft and its systems in cold climatic conditions.

PREFLIGHT PREPARATION

It is essential to take off with an aerodynamically clean airplane. Low temperatures and precipitation associated with cold weather operation create problems while the airplane is on the ground, in that frost, ice and snow adhere to and accumulate on the surfaces of the airplane. All surfaces of the airplane (wing, vertical and horizontal stabilizers, flight controls, spoilers and flaps) must be free of frost, ice and snow before takeoff. During periods of precipitation, once the airplane has been de-iced, anti-icing is likely to be required to ensure that the airplane remains aerodynamically clean for departure. De-icing/anti-icing must be accomplished at the last possible time prior to takeoff to maximize the time that anti-icing will be able to provide protection (holdover time). Refer to Learjet Addendum — GROUND DE-ICING/ANTI-ICING for de-icing/anti-icing procedures.

PREFLIGHT INSPECTION

1. Conduct normal exterior inspection.
2. Check the entire aircraft (including top surface of horizontal stabilizer) for ice, snow and frost. Brush off light snow. Remove all frost, encrusted snow and ice.
3. Remove ice, snow and dirt from landing gear shock struts and wheel wells. Check gear doors, position switches, squat switches, wheels, brakes and tires.
4. Carefully inspect engines for frozen precipitation in fan duct and tailpipe. Under certain climatic conditions, ice can form on the back of fan blades and cause vibration during start.

ENGINE START

Use of a GPU for an engine start is recommended at ambient temperatures of 32°F (0°C) or below. Ensure GPU is regulated to 28 VDC, has adequate capacity (at least 500 amps), and is limited to 1100 amps.

Use of SPR is recommended for engine starts at ambient temperatures of 0°F (-17.8°C) or below. During an engine start using SPR, discontinue SPR at 300-400°C Turbine Temperature (ITT).

NOTE Use of SPR is not required above 0°F (-17.8°C). Do not energize SPR at any time other than engine start.

If the engines are exposed to extremely cold temperatures (below -40°F [-40°C]) for an extended period, the engines should be preheated prior to attempting a start. For ambient temperatures between -40°F and -65°F (-40°C and -53.9°C), direct warm air flow into each engine for a minimum of 30 minutes prior to engine start.

During engine starts in cold weather, engine acceleration, particularly Fan Speed (N1), is much slower than normal and Turbine Temperature (ITT) has a tendency to increase more rapidly due to the increased spool-up times. Additionally, higher than normal oil pressure can be expected which may exceed the maximum allowable transients.

CAUTION During engine starts in cold conditions:

- If Fan Speed (N1) does not rise with Turbine Speed (N2) or stops during the start attempt, abort start.
- If Turbine Temperature (ITT) is rising rapidly and appears likely to exceed the start limit, abort start.
- Exceeding idle power with oil temperature below 30°C is not recommended. However, if ambient temperature prevents attainment of 30°C, idle power may be exceeded as required to further warm the oil to normal operating limits prior to takeoff.
- If abnormal engine vibration occurs during or after engine start, immediately abort start or shutdown engine and investigate for possible ice formation on back of fan blades.

When the aircraft has been cold soaked at ambient temperatures below -13°F (-25°C), the engines should be operated a minimum of 3 minutes to bring the hydraulic system up to normal operating temperature.

TAXIING

Use normal taxi procedures if the ramp and taxiways are clean and dry. If it is necessary to taxi on ice, snow, slush, or water, taxi at reduced speed and allow greater distance for stopping because of decreased braking efficiency.

If taxi is to be accomplished through slush or snow, use the brakes to create some friction-induced heating of the brake discs to prevent the brakes from freezing.

Use both engines for taxi on slippery surfaces. Directional control may be difficult to maintain during single-engine taxi on a slick surface.

Use anti-ice systems as required.

Insofar as possible, taxi should be accomplished with the flaps up on snow or slush covered surfaces.

Avoid taxiing in the exhaust wake or propeller wash of other aircraft on other than hard packed or dry surfaces.

Thrust reversers (if installed) should be used with extreme caution on slippery surfaces and only when absolutely necessary to maintain directional control.

Do not use thrust reversers (if installed) if taxiways and ramps are covered with slush, ice, standing water or snow except in the interest of safety.

TAKEOFF

If anti-ice systems are required for takeoff, the systems should be energized prior to setting takeoff power. Refer to Section V for aircraft takeoff performance data with anti-ice systems in operation.

Do not take off with runway water or slush accumulation of 3/4 inch (19mm) or more.

Do not take off with frost, snow, or ice on the wings or aircraft control surfaces, including the horizontal stabilizer and elevators. Refer to Learjet Addendum — DE-ICING/ANTI-ICING for de-icing/anti-icing procedures.

WARNING

Even **small** accumulations of ice on the wing leading edge can cause aerodynamic stall prior to activation of the stick shaker and/or pusher. These ice accumulations can also cause angle-of-attack indicator information to be unreliable.

AFTER TAKEOFF

After takeoff from a snow-covered or slush-covered runway, delay retracting landing gear to allow residual slush to be thrown or blown off.

BEFORE LANDING

If taxi or takeoff was made from a snow-covered or slush-covered field, it is recommended that the following procedure be used to help crack any ice between brake discs and between the brake discs and wheels:

1. After landing gear is extended, set ANTI-SKID switch to OFF.
2. Pump brakes 6 to 10 times. Use moderate to heavy braking pressure.
3. Prior to touchdown, set ANTI-SKID switch to ON and check ANTI-SKID lights are out.

LANDING

Use normal landing procedures if runway is clean and dry. Refer to Section V for landing distance factors to be applied when landing on wet or icy runways.

AFTER CLEARING RUNWAY

During moderate to heavy braking action on patchy snow or ice, avoid use of nose wheel steering above 10 knots.

CAUTION

For taxi after landing on a slush or snow covered field, it is recommended that the flaps not be retracted above 20°. This will protect flaps and wing from damage in the event ice or snow has accumulated on the flaps.

SHUTDOWN AND POSTFLIGHT

When the aircraft must be parked outside in extremely cold or fluctuating freeze/thaw temperatures, perform the following in addition to the normal shutdown and post-flight procedures:

1. Chock main gear wheels before releasing park brake. Do not leave aircraft parked for extended periods in subfreezing weather with parking brake set.
2. Remove ice, snow and dirt from landing gear shock struts and wheel wells. Check gear doors, position switches, squat switches, wheels and tires.
3. Remove ice, snow and dirt from flaps and flap tracks before retracting flaps.
4. If the aircraft is to be parked for an extended period at ambient temperatures of 20°F (-6.7°C) or below, it is recommended that the crew oxygen masks be stowed in a heated room or the cabin should be warmed to at least 20°F (-6.7°C) before use.
5. If the aircraft is to remain in subfreezing temperatures for an extended period, remove water and beverage containers from the aircraft. Remove toilet tank and reservoir fluid from aircraft or add ethylene glycol base anti-freeze containing antifoam agent to the flush fluid.
6. Install aircraft protective covers.
7. If the aircraft will be exposed to extremely cold temperatures for an extended period, it is recommended that the batteries be removed and stored in a warm area if possible.

PRESSURIZATION SYSTEM OPERATION

NOTE For Automatic Mode operation, refer to BEFORE STARTING ENGINES, AFTER TAKEOFF and DESCENT procedures in this section.

MANUAL MODE OPERATION

1. AUTO-MAN Switch — MAN.
2. UP-DN Manual Control (red) — As required to maintain satisfactory pressurization.
3. To return to automatic operation, proceed as follows:

- *Aircraft 35-067 thru 35-112 except 35-107, 36-018 thru 36-031:*

NOTE If cabin altitude should increase to 10,000 (±500) feet or above, the automatic mode is deactivated until the cabin altitude is decreased to 7500 feet or below.

a. CABIN ALT Controller — Set at or below 7500 feet.
b. RATE Knob — Turn to full INCR.
c. UP-DN Manual Control (red) — Control to altitude selected on CABIN ALT Controller.
d. CABIN CLIMB Speed Indicator — Stabilize at zero.
e. RATE Knob — Reset to nominal position.
f. AUTO-MAN Switch — AUTO.
g. CABIN ALT Controller — Reset (if required) to appropriate cabin altitude for flight altitude.

- *Aircraft 35-107, 35-113 & Subsequent and 36-032 & Subsequent:*

NOTE If cabin altitude should increase to 8750 (±250) feet or above, the automatic pressurization mode is deactivated and the amber CAB ALT light will illuminate. Automatic mode operation will not be available until the cabin altitude is decreased to extinguish the CAB ALT light.

a. CABIN CONTROLLER — Set at or below 7200 feet.
b. UP-DN Manual Control (red) — Control to altitude selected on Cabin Controller.
c. AUTO-MAN Switch — AUTO.
d. CABIN CONTROLLER — Reset (if required) to appropriate cabin altitude for flight altitude.

PRESSURIZATION SYSTEM OPERATION (CONT)

LANDING AT FIELD ELEVATION ABOVE 8500 FEET *(Aircraft with Emergency Pressurization Override Switches)*

DESCENT

1. EMER PRESS Switches — OVERRIDE.
2. AUTO-MAN Switch — MAN.
3. UP-DN Manual Control (red) — UP to destination field elevation.

NOTE

- After landing, leave EMER PRESS switches in OVERRIDE position. If the switches are set to NORMAL above approximately 9500 feet, emergency pressurization will activate. In the event of inadvertent activation of emergency airflow, the system may be reset as follows:
    a. EMER PRESS Switches — OVERRIDE.
    b. Both BLEED AIR Switches — OFF then ON.
- Applicable operating rules, pertaining to the use of oxygen at high cabin altitude, must be observed.

TAKEOFF AT FIELD ELEVATION ABOVE 8500 FEET *(Aircraft with Emergency Pressurization Override Switches)*

BEFORE STARTING ENGINES

1. EMER PRESS Switches — OVERRIDE.
2. BLEED AIR Switches — ON.
3. CAB AIR Switch — OFF.
4. AUTO-MAN Switch — MAN.

NOTE

- Applicable operating rules, pertaining to the use of oxygen at high cabin altitude, must be observed.
- At field elevations above 8750 (±250) feet, the automatic pressurization mode will be deactivated and the CAB ALT light will be illuminated.

5. CABIN CONTROLLER — Select cruising altitude or desired cabin altitude.

TAXI AND BEFORE TAKEOFF

1. CAB AIR Switch — ON.

AFTER TAKEOFF

1. UP-DN Manual Control (red) — DN to obtain cabin altitude selected on CABIN CONTROLLER.

PRESSURIZATION SYSTEM OPERATION (CONT)

2. AUTO-MAN Switch — AUTO.

NOTE The pressurization system cannot be reset to automatic mode until the CAB ALT light is extinguished.

3. EMER PRESS Switches — NORMAL.

CABIN TEMPERATURE CONTROL

Cabin air is provided by cooling engine bleed air in a ram air heat exchanger. Primary heating and cooling is obtained by controlling the amount of warm air that goes through the heat exchanger.

BLEED AIR HEATING AND COOLING

- *Aircraft 35-067 thru 35-112 except 35-107, 36-018 thru 36-031:*
  1. BLEED AIR Switches — On.
  2. CABIN AIR Switch — NORM.

CAUTION **Do not** select MAX position of CABIN AIR switch while on the ground. **Do not** perform extended engine operation above IDLE with CABIN AIR switch NORM. With the aircraft static there is no ram airflow through the heat exchanger and possible damage to air conditioning components could result. Cabin overheating and damage to cabin components may also occur.

  3. MAN-AUTO-HOT Knob — Rotate out of MAN detent to AUTO and turn to desired temperature. In flight, the cabin temperature control system will automatically maintain the cabin at the desired temperature.
  4. If satisfactory cabin temperature is not maintained:
     a. MAN-AUTO-HOT Knob — Rotate to MAN detent.
     b. MAN-HOT-COLD Switch — HOT or COLD until desired setting is reached.

- *Aircraft 35-107, 35-113 & Subsequent and 36-032 & Subsequent:*
  1. BLEED AIR Switches — ON.
  2. CAB AIR Switch — ON.

CAUTION With the aircraft sitting statically on the ground, **do not** perform extended engine operation above IDLE with CAB AIR switch ON. There is no ram airflow through the heat exchanger and possible damage to air conditioning components may occur.

CABIN TEMPERATURE CONTROL (CONT)

3. AUTO-MAN Switch — AUTO.
4. COLD-HOT Knob — Rotate to desired cabin temperature. In flight the cabin temperature control system will automatically maintain the cabin at the desired temperature.
5. If satisfactory cabin temperature is not maintained:
   a. AUTO MAN Switch — MAN.
   b. COLD HOT Knob — Rotate to desired setting.

ADDITIONAL COOLING OR TO DECREASE CABIN HUMIDITY

NOTE

- Power for the cooling system must be supplied by an engine generator or GPU.
- *On aircraft 35-067 thru 35-505 and 36-018 thru 36-053 not incorporating FCN 89-1,* **do not** operate cooling system above FL180.
- *On aircraft 35-506 & subsequent, 36-054 & subsequent and prior aircraft incorporating FCN 89-1,* **do not** operate cooling system above FL350.
- **Do not** turn on cooling system unless:
  - *Aircraft 35-067 thru 35-147 and 36-018 thru 36-035:*
    1. With one engine operating, the ammeter reads below 200 amps.
    2. With both engines operating, each ammeter reads below 250 amps.
  - *Aircraft 35-148 & subsequent and 36-036 & subsequent:*
    1. With one engine operating, the ammeter reads below 150 amps.
    2. With both engines operating, each ammeter reads below 250 amps.

1. COOL-FAN Switch — COOL.
2. If recirculation only is required, COOL-FAN Switch — FAN. CABIN BLOWER Rheostat (copilot's side panel, if installed) — As Desired.

CABIN TEMPERATURE CONTROL (CONT)

ADDITIONAL HEATING

- **35-067 thru 35-670 & 36-018 thru 36-063 when the Auxiliary Heater is installed**

CABIN

NOTE

- Power for the auxiliary heater must be supplied by an engine generator or GPU.
- **Do not** turn on the auxiliary heater unless:
  - *Aircraft 35-067 thru 35-147 and 36-018 thru 36-035:*
    1. With one engine operating, the ammeter reads below 200 amps.
    2. With both engines operating, each ammeter reads below 250 amps.
  - *Aircraft 35-148 & subsequent and 36-036 & subsequent:*
    1. With one engine operating, the ammeter reads below 150 amps.
    2. With both engines operating, each ammeter reads below 250 amps.

1. • *On aircraft with damper control knob (on blower duct in aft cabin),* Damper Control Knob — Rotate to CLOSE. Auxiliary heater will not operate unless knob is in CLOSE position.
   • *On aircraft with cabin blower switch (on blower duct in aft cabin),* Cabin Blower Switch — ON.
2. AUX HT Switch — HI or LO as desired.

COCKPIT *(35-643 thru 35-670, 36-062 & 36-063, and aircraft incorporating AAK 86-1 or SB 35/36-21-17)*

1. W/S AUX HEAT DEFOG Switch — CKPT.

CAUTION

To prevent damage to the heater element, cabin air must be On and airflow available before activating the cockpit heater.

CABIN TEMPERATURE CONTROL (CONT)

- **35-671 & subsequent and 36-064 & subsequent**

COCKPIT

1. AUX HT Switch — CREW.

NOTE The cockpit heater will not activate unless an engine is running and bleed air from that engine is available to the RH distribution duct.

CABIN

NOTE

- Power for the auxiliary heater must be supplied by an engine generator or GPU.
- Do not turn on the auxiliary heater unless:
  1. With one engine operating, the ammeter reads below 150 amps.
  2. With both engines operating, each ammeter reads below 250 amps.

1. Cabin Blower Switch (on blower duct in aft cabin) — ON.
2. AUX HT Switch — CAB & CREW.

ADDITIONAL AIR CIRCULATION

1. For additional cabin air circulation, Cooling System COOL-FAN Switch — FAN. CABIN BLOWER Rheostat (copilot's side panel, if installed) — As desired.
2. For additional cockpit air circulation, Cockpit Air Control — Rotate to desired setting.

NOTE If the overhead air outlets are closed, the cockpit blower must be turned off to prevent overheating blower motor.

AILERON AUGMENTATION

Spoilers are used to provide aileron control augmentation in the following airplane configuration:

1. SPOILER Switch — RET.
2. Flaps — Below 25 degrees.

Aileron augmentation will not be energized with flaps retracted above 25 degrees or when SPOILER switch is in the EXT position. Always check that SPOILER switch is in the RET position before actuating the SPOILERON RESET switch.

Normal spoiler operation overrides the aileron augmentation mode of operation and the SPOILER light will be illuminated anytime spoilers are extended 1 degree or more during normal spoiler operation.

With flaps lowered beyond 13° and spoiler extended, the SPOILER light will flash.

If the aileron augmentation system malfunctions, the AUG AIL light comes on and spoilers retract. However, actuating the SPOILERON RESET switch will restore normal operation if the system clears itself.

During Spoileron/Spoiler Check, if AUG AIL light does not come on, possible failures are:

1. Computer monitor failure.
2. Spoileron selector valve failure.

Continued operation with either of these failure modes could result in inadvertent asymmetrical spoiler extension. Malfunction should be corrected before flight.

OXYGEN SYSTEM

WARNING Smoking is prohibited while oxygen system is in use.

OXYGEN DURATION

The oxygen duration charts in Section IV show oxygen supply duration of a fully charged system as a function of cabin altitude and number of occupants using the system.

- Figure 4-1 is provided for Aircraft with ZMR 100 Series Diluter Demand Crew Masks.
- Figure 4-2 is provided for Aircraft with 6600214 Series Demand Crew Masks.
- Figure 4-3 is provided for Aircraft with Scott ATO Crew Masks.

PASSENGER OXYGEN

WARNING

- Passenger masks are intended for use during an emergency descent to an altitude not requiring supplemental oxygen.
- Passenger masks will not provide sufficient oxygen for prolonged operation above 34,000 feet cabin altitude. Prolonged operation above 25,000 feet cabin altitude with passengers on board is not recommended.

1. With the PASS OXY Valve in the OFF position, no oxygen is supplied to the cabin.
2. With the PASS OXY Valve in the NORM position and the PASS MASK Valve in the AUTO position, the passenger oxygen masks will drop from their storage compartments if the cabin altitude reaches 14,000 (±750) feet. Whenever the oxygen masks deploy, the upper center panel lights will illuminate to provide maximum visibility for donning masks. The passengers must don the masks and pull the attached lanyards to start the flow of oxygen.

NOTE If Generator and Battery switches are Off, automatic presentation of masks will not occur. In this event, turn PASS MASK Valve to MAN to deploy masks if passenger oxygen is required.

3. With the PASS OXY Valve in the NORM position and the PASS MASK Valve in the MAN position, the passenger oxygen masks will drop from their storage compartments. The passengers must don the masks and pull the attached lanyards to start the flow of oxygen. This should be used if automatic presentation of the masks does not occur.

Continued

OXYGEN SYSTEM (CONT)

4. Deploy passenger oxygen if pressurization irregularities are encountered above 10,000 feet MSL.

NOTE The rebreather bag may not inflate even though oxygen is flowing. This is normal.

CREW OXYGEN

1. If oxygen is required by the crew only, PASS OXY Valve — OFF.
2. When oxygen masks are worn by the crew, OXY-MIC Switch(es) — ON. Communication between crew members can be accomplished by using the INPH function of the audio control panel and increasing the MASTER VOL level.
3. Crew Oxygen Masks:
   - **Operate ZMR 100 series diluter-demand crew masks as follows:**
     a. With 100% OXY position (control lever down) selected on the mask regulator, the mask will provide 100% oxygen at all cabin altitudes. Maintain the 100% OXY position on undonned masks to reduce crew member action in the event of pressurization system failure or smoke in the cabin. 100% OXY must be selected for cabin altitudes above 20,000 feet.
     b. With NORMAL position (control lever up) selected on the mask regulator, the mask will deliver diluted oxygen. When using oxygen at cabin altitudes below 20,000 feet, the NORMAL position should be selected to conserve oxygen and provide greater oxygen duration times.
   - **Operate 6600214 series masks with Robertshaw regulators as follows:**
     a. With NORMAL selected on the Pressure Regulator Control and "normal" (100% lever locked up) selected on the Diluter Control, the crew mask will deliver automatic oxygen dilution from S.L. to 30,000 feet cabin altitude. Above 30,000 feet cabin altitude, the mask will provide 100% oxygen and maintain a slight positive pressure.
     b. To obtain 100% oxygen at any time, depress 100% lever.
     c. For emergency operation, select EMERGENCY on the Pressure Regulator Control and depress 100% lever on the Diluter Control. With the regulator controls in this position, the crew mask will deliver 100% oxygen and maintain a slight positive pressure for respiratory protection from smoke and fumes.

OXYGEN SYSTEM (CONT)

- **Operate 6600214 series crew masks with Puritan-Bennett regulators as follows:**
  a. With NORM selected on the Pressure Regulator Control, the crew mask will deliver automatic oxygen dilution from S.L. to 33,000 feet cabin altitude and 100% oxygen above 33,000 feet cabin altitude. Automatic positive pressure breathing is provided above 39,000 feet cabin altitude.
  b. To obtain 100% oxygen at any time, select 100% on the Pressure Regulator Control.
  c. For emergency operation, select EMER on the Pressure Regulator Control. With the regulator control in this position, the crew mask will deliver 100% oxygen, maintain a slight positive pressure in the mask cup at all times for respiratory protection from smoke or fumes, and automatic positive pressure breathing above 39,000 feet cabin altitude.

- **Operate Scott ATO masks as follows:**
  a. To check for oxygen availability to the mask while stowed, depress the PRESS TO TEST button/knob on the bottom of mask pressure regulator — oxygen will flow while button is held.
  b. To don crew oxygen masks:
    (1) Remove hats and "ear muff" type headsets.

NOTE Headsets and eyeglasses worn by crew members may interfere with quick-donning capabilities.

    (2) Squeeze and hold the red handles on the mask pressure regulator together to inflate the pneumatic harness for donning.
    (3) Position harness over the head, position mask as desired, then release red handles.
    (4) Ensure that mask is properly sealed. Reposition mask if required.

NOTE Beards worn by crew members may make proper sealing of the mask more difficult.

  c. With the 100% lever extended and the PRESS TO TEST button/knob rotated to the ▼ position, the mask will deliver automatic oxygen dilution from S.L. to 30,000 feet cabin altitude, 100% oxygen above 30,000 feet cabin altitude, and automatic pressure breathing above approximately 37,000 feet cabin altitude.

OXYGEN SYSTEM (CONT)

d. To obtain 100% oxygen at any time, depress 100% lever on mask pressure regulator.
e. For emergency operation, select EMERGENCY (rotate PRESS TO TEST button/knob to ●). With the mask pressure regulator controls in this position the crew mask will deliver 100% oxygen at all cabin altitudes and maintain a positive pressure in the mask cup at all times for respiratory protection from smoke or fumes.

BRAKE SYSTEMS

The primary brake system utilizes hydraulic system pressure for power boost and incorporates an anti-skid system to prevent tire skid and/or tire blow-out during landing or aborted takeoff. The brakes are operated by depressing the upper portion of the rudder pedals.

NOTE Large temperature differences between wheels after landing may indicate improper brake operation.

A parking brake is installed. The parking brake is operated by depressing and holding the toe brakes (hydraulic system pressurized) and then pulling the PARKING BRAKE handle to set the brakes. Some aircraft have a PARK BRAKE light installed on the instrument panel which illuminates whenever the PARKING BRAKE handle is not fully in.

An emergency air braking system is installed to provide emergency braking in the event of a hydraulic system failure. Refer to EMERGENCY PROCEDURES (Section III) for emergency braking procedures.

NORMAL BRAKING

Anti-skid On Operation:

1. ANTI-SKID Switch — On. Check ANTI-SKID GEN lights extinguished.
2. Apply brakes as required. Maximum braking pressures can be maintained when anti-skid is operative.

NOTE The takeoff and landing distances with anti-skid On, presented in Section V of this manual, are based on full anti-skid braking from first brake application to complete stop.

BRAKE SYSTEMS (CONT)

Anti-skid Off Operation:

When anti-skid is inoperative, care must be used during brake application and stopping distances will be increased. Refer to Section IV for operation of the brake system with anti-skid off, and Section V for increased stopping distances.

EMERGENCY BRAKING

In the event of a normal brake system failure, emergency (pneumatic) brakes can be used to stop the airplane. Refer to Section III for operation of the emergency brake system.

LANDING GEAR WARNING SYSTEM

The landing gear warning horn only will sound under the following conditions:

- Landing gear is not extended.
- Flaps are lowered beyond 25°.

NOTE When the horn sounds because the flaps are lowered, the horn cannot be silenced by the mute switches.

The landing gear warning horn will sound and the three red UNSAFE lights will illuminate under the following conditions:

- Landing gear is not extended.
- Altitude is below 14,500 feet.
- Airspeed is below 170 KIAS.
- Either thrust lever is retarded (below 70% N_1).

NOTE When the horn sounds under these conditions, the horn can be silenced by moving the TEST-MUTE switch, on the LANDING GEAR control panel, to MUTE or depressing the MUTE button in the right thrust lever handle (if installed). The UNSAFE light indication will continue until either the gear is lowered or one of the above conditions is corrected.

FUEL MANAGEMENT

For flight planning, use only TOTAL pound indication on the fuel quantity gage. **Do not** use separate tank indications for this purpose. The fuel quantity indicating system is set to indicate properly in level flight.

The red LOW FUEL warning light on the glareshield annunciator panel will illuminate when the fuel level in either wing tank is approximately 400-500 pounds.

The amber FUEL XFLO light (if installed) on the glareshield annunciator panel will be illuminated whenever the crossflow valve is open. The crossflow valve will be open during wing to wing transfer, wing to fuselage transfer, or fuselage to wing transfer.

Steady illumination of any of the amber fuel system valve lights on the fuel control panel, except fuel jettison valve lights, indicates the corresponding valves are not in the position selected. Momentary illumination while the corresponding valve is in transit after switching modes indicates proper operation.

On aircraft incorporating SB 35/36-28-11, illumination of the annunciator installed in either STANDBY PUMP switch indicates power is applied to the corresponding standby fuel pump (regardless of switch position). It is normal for the annunciators to illuminate during starter-assisted starts, fuselage tank FILL operations and whenever the STANDBY PUMP switch is ON.

The fuel control panel on the pedestal contains all the necessary switches and indicators to fuel the aircraft and maintain proper fuel management.

FUEL MANAGEMENT (CONT)

NORMAL FUSELAGE FUEL TRANSFER *(Model 35A without FUS VALVE Switch)*

CAUTION

Do not energize fuselage fuel transfer system when wing and tip tanks are full.

1. FUS TANK XFER-FILL Switch — XFER when tip tank fuel quantity indicates 760 pounds or less in each tank. When XFER is selected, the standby pumps will be de-energized, the crossflow valve will open, the fuselage tank valve will open, and the transfer pump will be energized.

NOTE

- If the crossflow valve fails to open, fuselage fuel cannot be transferred forward to the wing tanks using the transfer pump. However, fuselage fuel will gravity flow into the right wing tank until the heads are equal. A right wing heavy condition will occur.
- Plan fuel requirements to ensure return to takeoff point or alternate if fuselage tank fails to transfer.

2. FUS TANK XFER-FILL Switch — OFF after EMPTY light comes on.

NORMAL FUSELAGE FUEL TRANSFER *(Model 35A with FUS VALVE Switch and Model 36A)*

CAUTION

Do not energize fuselage fuel transfer system when wing and tip tanks are full.

1. FUS TANK XFER-FILL Switch — XFER when tip tank fuel quantity indicates 760 pounds or less in each tank *(Model 35A)* or zero fuel in each tank *(Model 36A)*. When XFER is selected, the standby pumps will be de-energized, the crossflow valve will open, the fuselage tank valve will open, and the transfer pump will be energized.

NOTE

If the crossflow valve fails to open, fuselage fuel cannot be transferred forward to the wing tanks using the transfer pump. However, fuselage fuel will gravity flow into the left wing until the heads are equal. A left wing heavy condition will occur.

2. FUS TANK XFER-FILL Switch — OFF after EMPTY light comes on.

FUEL MANAGEMENT (CONT)

AUXILIARY FUSELAGE FUEL TRANSFER *(Aircraft with FUS VALVE Switch)*

This procedure may be used to minimize transfer pump operation and may be used **only** if Jet Pumps are operating.

1. STANDBY PUMP Switches — Off.

NOTE Activation of standby pumps will override gravity transfer and cause the right transfer and crossflow valves to close.

2. FUS VALVE Switch — OPEN when tip tank fuel quantity indicates 760 pounds or less in each tank. When OPEN is selected the right fuselage transfer valve and the crossflow valve will open. Fuel will gravity flow from the fuselage tank until the wing tank heads are equal.

NOTE If the crossflow valve fails to open, a right wing heavy condition will occur.

3. FUS VALVE Switch — CLOSE, when wing fuel quantity starts to decrease or prior to approach.

NOTE If the right fuselage transfer valve (FUS VALVE) is allowed to remain open when normal transfer is activated, some fuel will recirculate into the fuselage tank through the right transfer line.

4. FUS TANK XFER-FILL Switch — XFER.
5. FUS TANK XFER-FILL Switch — OFF when EMPTY light comes on.

FUEL MANAGEMENT (CONT)

FUEL CROSSFLOW (WING-TO-WING FUEL TRANSFER)

CAUTION **Do not** crossflow with jet pump inoperative. Engine starvation may occur due to fuel being pumped through open crossflow valve into opposite wing.

1. CROSSFLOW Switch — OPEN.
2. STANDBY PUMP Switch (heavy wing) — ON.
3. STANDBY PUMP Switch (light wing) — Off.
4. CROSSFLOW Switch — CLOSE after fuel balance is obtained.
5. STANDBY PUMP Switches — Off.
6. If the preceding procedure fails to balance fuel, unequal power settings may be used to balance fuel load.

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REFUELING

The airplane is refueled through filler caps on the tip tanks. Fuel gravity flows from the tip tanks to wing tanks. The wing fuel pumps are used to fill the fuselage tank. Refer to Addendum — FUEL SERVICING for refueling procedures.

To prevent fuel filter icing and possible engine flameout, anti-icing additive must be blended with the fuel in the concentration specified in FUEL LIMITS, Section I.

The electronic fuel computers must be adjusted to the recommended specific gravity position as specified in FUEL LIMITS, Section I. Refer to Addendum — FUEL SERVICING for adjustment procedures

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ICE DETECTION

Identification of ice on aircraft surfaces can be accomplished by the following methods:

1. Ice formation on the lower corners of the windshield or nose of the tip tank.
2. During night flights, two red ice detect lights will cause red areas approximately 1-1/2 inches (38.1 mm) in diameter to appear on the windshield when particles of ice or moisture adhere to the windshield. The light on the pilot's side is located in the defog airstream and the copilot's light is located outside the defog airstream; therefore, the copilot must monitor the light on his side when the windshield heat or alcohol de-ice systems are operating. The windshield ice detect lights will indicate ice encounters when OAT is below freezing and moisture encounters when OAT is above freezing. Refer to figure in Section V entitled RAM AIR — OUTSIDE AIR TEMPERATURE CONVERSION for RAT to OAT conversion.
3. Wing and horizontal stabilizer temperature conditions where icing may occur can be identified through the use of the WING TEMP and STAB TEMP indicators. When the indicator pointer is in the green arc, the wing or stabilizer structure is above 35°F (1.7°C) and is warm enough so that ice will not adhere to the surface. When the pointer is in the yellow area the structure is approaching a "too hot" condition. When the pointer is in the red arc, the structure is below 35°F (1.7°C) and indicates the anti-ice system should be used, if flying through visible moisture.
4. A visual inspection may be used to check for ice accumulations on the wing leading edges.

- *On aircraft 35-067 thru 35-415 and aircraft 36-018 thru 36-047,* the optional wing inspection light on the right fuselage below the emergency exit may be used to check for ice buildup on the wings during night operations. The wing inspection light, in itself, is inadequate for detecting the presence of ice near the wing tips. The wing inspection light is illuminated by setting the WING INSPECTION switch (pedestal) to ON.

NOTE

If the presence of ice on the wing leading edge is suspected during night operations in atmospheric conditions conducive to icing, the normal approach speeds must be increased per the WING HEAT FAILURE LANDING procedure in Section IV — ABNORMAL PROCEDURES.

ICE DETECTION (CONT)

- *On aircraft 35-416 and subsequent and aircraft 36-048 and subsequent,* an optional wing inspection light on the right forward fuselage may be used to check for ice buildup on the wings during night operations. The light illuminates a black dot placed on the outboard wing leading edge to enhance visual detection of ice accumulation. The wing inspection light is illuminated by pressing the WING INSP LT switch (copilot's dimmer panel). The light is extinguished when the switch is released.

NOTE

If the presence of ice on the wing leading edge is detected, the normal approach speeds must be increased per the WING HEAT FAILURE-LANDING procedure in Section IV — ABNORMAL PROCEDURES.

ANTI-ICE SYSTEMS

Anti-ice systems should be turned on prior to operation in icing conditions. Icing conditions exists when the outside air temperature is 10°C to -40°C and visible moisture in any form is present (such as clouds, rain, snow, sleet, ice crystals, or fog with visibility of 1 mile or less.)

If icing conditions are encountered and the anti-ice systems have not been energized, turn them on prior to significant ice accumulation. Observe recommendations for normal use of all anti-ice systems.

WARNING

Even **small** accumulations of ice on the wing leading edge can cause aerodynamic stall prior to activation of the stick shaker and/or pusher. These ice accumulations can also cause angle-of-attack indicator information to be unreliable.

Minimize the duration of icing encounters as much as practical. Minimize holding in icing conditions with flaps extended. This includes requesting an altitude above or below icing conditions, if practical.

Intermittently operating with the autopilot off will allow more readily detectable changes in flight control feel.

If flight has been conducted in icing conditions, remove any accumulated ice prior to next flight.

In the event of significant ice accumulation or failure of any portion of the anti-ice system, refer to INADVERTENT ICING ENCOUNTER and/or appropriate Anti-Ice System Failure procedures in Section IV.

When using anti-ice systems at high altitude, the cabin altitude may exceed 8000 feet unless engine speed is increased to compensate for the additional bleed air extraction.

Aircraft anti-icing is accomplished through the use of electrically heated anti-ice systems, engine bleed-air heated anti-ice systems, and alcohol anti-ice systems. Electrically heated systems include static ports, pitot tubes, engine inlet air-temperature and pressure sensor, and stall warning vanes. Engine bleed air is utilized to heat the wing leading edge, horizontal stabilizer leading edge, windshield and engine anti-icing. An alcohol anti-ice system is installed for radome anti-ice and as a back-up for windshield bleed air anti-ice system.

NOTE

In icing conditions above approximately 12,000 feet, ice buildup may occur at the junction of the wings and tip tanks. Satisfactory handling qualities have been demonstrated with this ice accumulation. Below approximately 12,000 feet, using normal descent procedures, all wing leading edge ice will be removed.

ANTI-ICE SYSTEMS (CONT)

On aircraft 35-643 thru 35-670, 36-062 & 36-063 and prior aircraft incorporating AAK 86-1 or SB 35/36-21-17, a combination of bleed air (heated with a supplemental electric heater) and air conditioned air provides defogging of the windshield interior in addition to the normal defogging provided by cabin airflow.

On aircraft 35-671 & subsequent and 36-064 & subsequent, an electrically heated windshield provides defogging of the windshield interior. The heat output of the windshield is not sufficient to prevent ice formation. Therefore, bleed air windshield heat should be turned on prior to entering icing conditions.

Systems controls and control functions are as follows:

1. STAB WING HEAT Switch — Controls wing and horizontal stabilizer heat systems (bleed air).
2. NAC HEAT Switches — Control engine anti-icing (bleed air) and engine inlet air temperature/pressure sensor electric heaters. *On aircraft 35-067 thru 35-244 and 36-018 thru 36-044 not incorporating AAK 79-4,* the engine spinner anti-ice is also activated.
3. PITOT HEAT Switches — Energize pitot-static probe, stall warning vane heaters, and total temperature probe (if installed) heaters.
4. WSHLD & RADOME — RADOME or RAD Switch — Controls windshield and radome alcohol anti-ice system.
5. • *On aircraft 35-067 thru 35-112 except 35-107, 36-018 thru 36-031,* WSHLD HEAT Switches and IN NORMAL OUT DEFOG Knob — Control bleed air to the windshield for defog, anti-ice and rain removal.
   - *On aircraft 35-107, 35-113 & subsequent and 36-032 & subsequent,* WSHLD HT ON-HOLD-OFF Switch — Controls bleed air to the windshield for defog, anti-ice and rain removal.
6. *On aircraft 35-643 thru 35-670, 36-062 & 36-063 and prior aircraft incorporating AAK 86-1 or SB 35/36-21-17,* W/S AUX DEFOG HEAT - CKPT Switch — Controls the supplemental electric heater and Freon cooling system for additional windshield defogging.
7. *On aircraft 35-671 & subsequent and 36-064 & subsequent,* WSHLD DEFOG Switch — Controls the electrically heated windshield for windshield defogging.
8. The red ice detect lights are energized whenever the battery switches are On.

ANTI-ICE SYSTEMS (CONT)

EXTERIOR WINDSHIELD DEFOG, ANTI-ICE, AND RAIN REMOVAL

- ***Aircraft 35-067 thru 35-112 except 35-107 not incorporating AMK 91-2. Aircraft 36-018 thru 36-031 not incorporating AMK 91-2.***

AUTOMATIC OPERATION

1. IN NORMAL OUT DEFOG Knob — Pull out.
2. WSHLD HEAT AUTO-MAN Switch — AUTO. The green WSHLD HEAT light will come on when the control valve begins to open. The valve will go to full open. If the red WSHLD OV HT light comes on, the airflow will automatically stop until the windshield has cooled sufficiently, then resume.
3. Automatic operation is recommended when constant use of the system is required.
4. To de-energize the system:
    a. AUTO-MAN Switch — MAN.
    b. ON-OFF Switch — Hold to OFF until the airflow stops.

NOTE

If the system continually cycles to the WSHLD OV HT mode after prolonged use, it can be prevented by switching the AUTO-MAN switch to MAN and holding the ON-OFF switch to OFF for reduced defog flow.

MANUAL OPERATION

1. IN NORMAL OUT DEFOG Knob — Pull out.
2. WSHLD HEAT AUTO-MAN Switch — MAN.
3. WSHLD HEAT ON-OFF Switch — Hold ON until the desired amount of airflow is obtained. As the valve opens, the green WSHLD HT light will illuminate and the defog flow will remain at the level it is when the ON-OFF switch is released. If the red WSHLD OV HT light comes on, the airflow will automatically stop until the windshield has cooled sufficiently, then resume.

NOTE

If the system continually cycles to the WSHLD OV HT mode after prolonged use, windshield airflow may be decreased by holding the WSHLD HT ON-OFF switch to OFF until desired airflow is reached and then releasing switch.

IF AIRFLOW SHOULD FAIL

The pilot's windshield may be anti-iced by the following:

1. WSHLD & RADOME/RADOME Switch — WSHLD & RADOME. This will anti-ice the radome and the pilot's windshield and give alcohol flow for approximately 45 minutes. The amber ALC AI light will come on when alcohol is depleted.
2. WSHLD & RADOME/RADOME Switch — OFF when ALC AI light illuminates or clear of icing conditions.

ANTI-ICE SYSTEMS (CONT)

- ***Aircraft 35-067 thru 35-112 except 35-107 incorporating AMK 91-2. Aircraft 36-018 thru 36-031 incorporating AMK 91-2.***

AUTOMATIC OPERATION

1. IN NORMAL OUT DEFOG Knob — Pull out.
2. WSHLD HEAT AUTO-MAN Switch — AUTO. The green WSHLD HEAT light will illuminate.

NOTE

The overheat shutoff valve may cycle to prevent overheating of the windshield. When the overheat shutoff valve cycles closed, the green WSHLD HEAT light will extinguish. The system will automatically reset (green WSHLD HEAT light will illuminate) after the system cools.

3. Automatic operation is recommended when constant use of the system is required.
4. To reduce flow in the event of excessive noise or system cycling:
   a. AUTO-MAN Switch — MAN.
   b. ON-OFF Switch — Hold to OFF until flow is acceptable. Flow will remain at the level it is when the ON-OFF switch is released.

MANUAL OPERATION

1. IN NORMAL OUT DEFOG Knob — Pull out.
2. WSHLD HEAT AUTO-MAN Switch — MAN.
3. WSHLD HEAT ON-OFF Switch — Hold ON (green WSHLD HEAT light will illuminate) until the desired amount of airflow is obtained. Flow will remain at the level it is when the ON-OFF switch is released.

IF **WSHLD OV HT** LIGHT ILLUMINATES

1. AUTO-MAN Switch — MAN.
2. ON-OFF Switch — Hold to OFF until WSHLD OV HT light extinguishes. Flow will remain at the level it is when the ON-OFF switch is released.

TO DEACTIVATE THE SYSTEM

1. AUTO-MAN Switch — MAN.
2. ON-OFF Switch — Hold to OFF until flow stops.

ANTI-ICE SYSTEMS (CONT)

IF AIRFLOW SHOULD FAIL

The pilot's windshield may be anti-iced by the following:

1. WSHLD & RADOME/RADOME Switch — WSHLD & RADOME. This will anti-ice the radome and the pilot's windshield and give alcohol flow for approximately 45 minutes. The ALC AI light will come on when alcohol is depleted.
2. WSHLD & RADOME/RADOME Switch — OFF when ALC AI light illuminates or clear of icing conditions.

- ***Aircraft 35-107, 35-113 thru 35-662 not incorporating AMK 91-2. Aircraft 36-032 thru 36-063 not incorporating AMK 91-2.***

The WSHLD HT switch has three positions labeled ON, HOLD, OFF. In the OFF position, no windshield airflow is available. In the ON position, the control valve is fully open allowing maximum airflow to the windshield. The HOLD position is used to stop the control valve in any position between fully closed and fully open. If a change in airflow is desired, set switch to OFF or ON until desired airflow is obtained then set switch to HOLD.

TO ACTIVATE THE SYSTEM

1. WSHLD HT Switch — ON. The green WSHLD HT light will come on when the control valve begins to open. If the red WSHLD OV HT light comes on, the overheat shutoff valve will automatically close until the windshield has cooled, then open again.
2. To reduce flow in the event of excessive noise or system cycling: WSHLD HT Switch — OFF, until flow is acceptable, then HOLD.

TO DEACTIVATE THE SYSTEM:

1. WSHLD HT Switch — OFF.

IF AIRFLOW SHOULD FAIL

The pilot's windshield may be anti-iced by the following:

1. WSHLD/RADOME-RAD Switch — WSHLD/RADOME. This will anti-ice the radome and pilot's windshield and give alcohol flow for approximately 45 minutes. The amber ALC AI light will illuminate when alcohol level is low.
2. WSHLD/RADOME-RAD Switch — OFF when alcohol is depleted or clear of icing conditions.

ANTI-ICE SYSTEMS (CONT)

- ***Aircraft 35-663 & Subsequent and 35-107, 35-113 thru 35-662 incorporating AMK 91-2. Aircraft 36-064 & Subsequent and 36-032 thru 36-063 incorporating AMK 91-2.***

The WSHLD HT switch has three positions labeled ON, HOLD, OFF. In the OFF position, no windshield airflow is available. In the ON position, the control valve is fully open allowing maximum airflow to the windshield. The HOLD position is used to stop the control valve in any position between fully closed and fully open. If a change in airflow is desired, set switch to OFF or ON until desired airflow is obtained then set switch to HOLD. Illumination of the red WSHLD OV HT light indicates a windshield heat system failure.

TO ACTIVATE THE SYSTEM:

1. WSHLD HT Switch — ON. The green WSHLD HT light will illuminate.

NOTE The overheat shutoff valve may cycle to prevent overheating of the windshield. When the overheat shutoff valve cycles closed, the green WSHLD HT light will extinguish. The system will automatically reset (green WSHLD HT light will illuminate) after the system cools.

2. To reduce flow in the event of excessive noise or system cycling: WSHLD HT Switch — OFF until flow is acceptable, then HOLD.

IF **WSHLD OV HT** LIGHT ILLUMINATES:

1. WSHLD HT Switch — OFF until red WSHLD OV HT light extinguishes, then HOLD.

TO DEACTIVATE THE SYSTEM:

1. WSHLD HT Switch — OFF.

IF AIRFLOW SHOULD FAIL

The pilot's windshield may be anti-iced by the following:

1. WSHLD/RADOME-RAD Switch — WSHLD/RADOME. This will anti-ice the radome and pilot's windshield and give alcohol flow for approximately 45 minutes. The amber ALC AI light will illuminate when alcohol level is low.
2. WSHLD/RADOME-RAD Switch — OFF when alcohol is depleted or clear of icing conditions.

ANTI-ICE SYSTEMS (CONT)

INTERIOR WINDSHIELD AND PASSENGER WINDOW DEFOG

The windshield interior and passenger windows are normally defogged by normal cabin airflow. *On aircraft 35-643 thru 35-670, 36-062 & 36-063, and aircraft incorporating AAK 86-1 or SB 35/36-21-17*, additional windshield defogging is provided by the windshield auxiliary defog heat system. *On aircraft 35-671 & subsequent and 36-064 & subsequent*, interior windshield defogging is provided by electrically heated windshield panels.

- ***Aircraft 35-643 thru 35-670, 36-062 & 36-063 and aircraft incorporating AAK 86-1 or SB 35/36-21-17.***

TO PROVIDE ADDITIONAL WINDSHIELD DEFOGGING:

1. W/S AUX DEFOG HEAT Switch — DEFOG HEAT. This adds additional heat to the cabin air normally used to defog the windshield and activates the freon cooling system (below 18,000 feet) to dehumidify the cabin air.

NOTE With COOL-FAN switch in OFF position, the cool air from the freon system is diverted between the cabin headliner and the fuselage skin to prevent lowering the cabin temperature.

2. If operation of the freon cooling system is not desired, W/S AUX DEFOG HEAT Switch — CKPT.

NOTE Power for the windshield auxiliary defog heat system must be supplied by an engine generator or GPU.

FOR MAXIMUM WINDSHIELD DEFOGGING:

1. Approximately 15 minutes prior to descent, W/S AUX DEFOG HEAT Switch — DEFOG HEAT.
2. At start of descent:
   a. Cockpit Shoulder and Ankle Eyeball Outlets — Close.
   b. Windshield Heat — On.
3. *On aircraft 35-506 & Subsequent, 36-054 & Subsequent and prior aircraft incorporating FCN 89-1*, at FL 350:
   a. COOL-FAN Switch — COOL.

NOTE If desired, rotate cabin air damper control knob to the Open position or set cabin blower switch (on blower duct in aft cabin) to OFF, as applicable. This will divert airflow from the evaporator for passenger comfort.

   b. Cockpit Air Control — Low.

ANTI-ICE SYSTEMS (CONT)

4. At FL180, Cabin Air Damper Control Knob (on blower duct in aft cabin) — Rotate to closed position, if applicable.
5. Leave Cabin Air, Windshield Auxiliary Defog Heat and Windshield Heat on until shutdown.

- ***Aircraft 35-671 & Subsequent. Aircraft 36-064 & Subsequent***

TO PROVIDE ADDITIONAL WINDSHIELD DEFOGGING:

1. WSHLD DEFOG Switch — On. This activates the electrically heated windshield panels.

NOTE Normal system operation is indicated by illumination of the L and R WSHLD DEFOG lights when the system is activated (windshield temperature below 80°F). When the windshield is heated above 80°F, the WSHLD DEFOG lights will extinguish.

FOR MAXIMUM WINDSHIELD DEFOGGING:

1. At start of descent, WSHLD HT — On.
2. Leave CAB AIR, WSHLD DEFOG, and WSHLD HT on until shutdown.

ANTI-ICE SYSTEMS (CONT)

RADOME ANTI-ICE

- ***Aircraft 35-067 thru 35-112 except 35-107. Aircraft 36-018 thru 36-031.***

Anti-icing the radome prevents ice from shedding off the nose and entering the engines. Anti-icing the radome is accomplished by setting the WSHLD & RADOME/RADOME switch to RADOME. Alcohol for radome anti-icing only will last for approximately 1-1/2 hours. The ALC AI light will illuminate when alcohol is depleted. Set WSHLD & RADOME/RADOME switch OFF when ALC AI light illuminates or clear of icing conditions.

NOTE Use WSHLD & RADOME position of the switch if bleed airflow for windshield anti-ice has failed, or as needed.

- ***Aircraft 35-107, 35-113 and subsequent. Aircraft 36-032 and subsequent.***

Anti-icing the radome prevents ice from shedding off the nose and entering the engines. Anti-icing the radome is accomplished by setting the WSHLD/RADOME/RAD switch to RAD. Alcohol for radome anti-icing only will last for approximately 2 hours 9 minutes. The ALC AI light will illuminate when alcohol level is low. Set WSHLD/RADOME/RAD switch OFF when alcohol is depleted or clear of icing conditions.

NOTE Use WSHLD/RADOME position of the switch if bleed air for the windshield anti-ice has failed or as needed.

WING AND HORIZONTAL STABILIZER ANTI-ICE

Wing and horizontal stabilizer anti-ice systems utilize engine bleed air directed through diffuser tubes in the leading edges for anti-icing.

1. STAB WING HEAT Switch — ON.
2. Monitor WING TEMP and STAB TEMP Indicators and WING OV HT and STAB OV HT lights. Maintain the indicators in the green range. Adjust power as necessary to maintain anti-icing and pressurization. If indicators progress to the yellow range, structure is approaching "too hot" condition. Corrective action can be taken by turning the STAB WING HEAT switch OFF and/or reducing engine RPM until indicators are back into the green range.

NOTE If the system is on and the WING TEMP or STAB TEMP indicator is in the red range, a system failure is indicated.

ANTI-ICE SYSTEMS (CONT)

NACELLE HEAT

The NAC HEAT switches energize both nacelle heat and engine inlet air pressure and temperature sensor heat. If installed, the NAC HEAT ON light or optional L or R NAC HEAT lights will illuminate anytime a NAC HEAT switch is set On. *On aircraft 35-067 thru 35-244 and 36-018 thru 36-044 not incorporating AAK 79-4,* the NAC HEAT switches also energize engine anti-ice.

CAUTION

To prevent damage to the engine inlet sensor heating element, nacelle heat operation should be limited to 30 seconds if the engine is not running.

NOTE

- Illumination of the L or R ENG ICE lights with the NAC HEAT switches On indicates that bleed air pressure is not being applied to the nacelle heat anti-ice system due to a malfunction.
- Illumination of the L or R ENG ICE lights with the NAC HEAT switches OFF indicates that bleed air pressure is being applied to the nacelle heat system due to a malfunction.

PITOT-STATIC HEAT

Anti-ice protection for pitot-static probe, stall warning vanes, total temperature probe heater (if installed) is accomplished by setting the L and R PITOT HEAT switches On.

PITOT HEAT MONITOR

A dual pitot heat monitor system provides the crew with a means of determining if sufficient current is being applied to the pitot-static probe heating elements.

- *On aircraft equipped with Single PITOT HEAT light,* with the BAT and PITOT HEAT switches On, illumination of the PITOT HEAT light indicates insufficient current is being applied to a pitot-static probe heating element. A failure in either system will cause the light to illuminate. The light will also illuminate whenever the BAT switches are On and either PITOT HEAT switch is OFF.
- *On aircraft equipped with L & R PITOT HEAT lights,* a failure in a pitot-static probe heating system will illuminate the applicable light. The applicable light will also illuminate whenever the BAT switches are On and the corresponding PITOT HEAT switch is OFF.

AUDIO CONTROL SYSTEM PANEL

The audio control system panels provide a means of controlling communications and/or navigation audio information being received or transmitted. The panel also controls audio communication within the cabin.

SWITCH FUNCTION

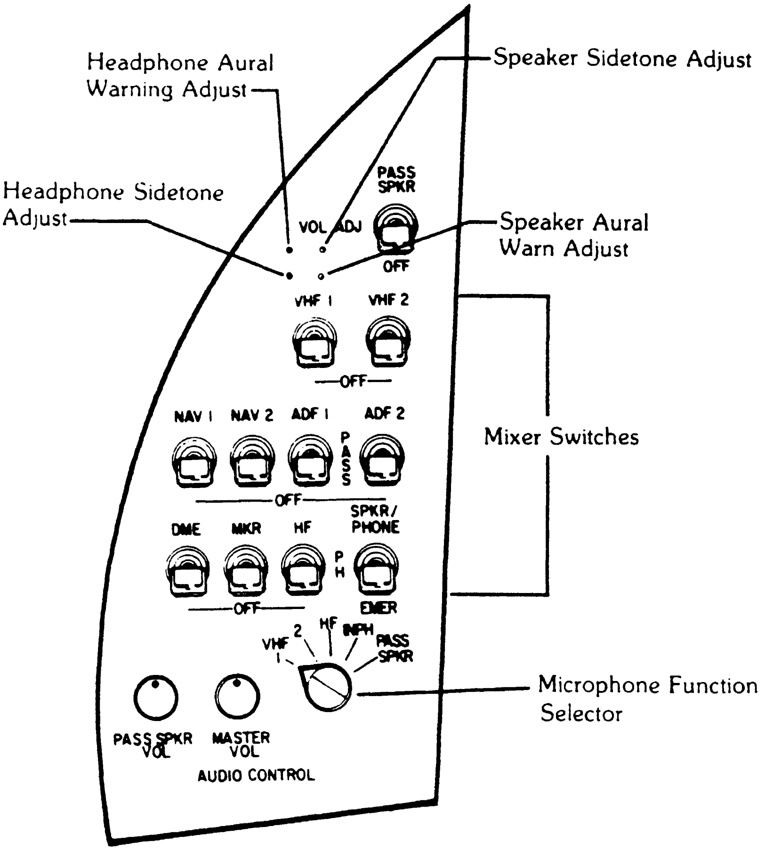
VOLUME CONTROLS

1. MASTER VOL — This control regulates the volume level of all audio input except sidetone audio, PASS SPKR audio, aural warning signals, and microphone or headphone audio when the SPKR/PHONE-PH-EMER switch is in the EMER position.
2. PASS SPKR VOL — This control regulates the volume level of the ADF in the cockpit speaker when the ADF switch is in the PASS position and the PASS SPKR-VOL ADJ-OFF switch is in the OFF or VOL ADJ position. The control also regulates the volume level of the ADF in the passenger speakers when the PASS SPKR switch is in the PASS SPKR position. Additionally, the control regulates passenger speaker volume while addressing passengers when the Mic Function Selector is in the PASS SPKR position. This control does not affect headphone, aural warning, or microphone audio when the microphone is being used in VHF 1 or 2, HF, or INPH on the Mic Function Selector.
3. Sidetone — Two small holes are provided on the front of the Audio Control Panel (Figure 2-4) for insertion of a screwdriver to adjust speaker and phone sidetone levels. Sidetone adjustments should be made to a comfortable level without acoustical feedback with the engines running. It is suggested that sidetone level be adjusted using VHF 1. This will simultaneously adjust sidetone for VHF 2, HF (if applicable), and INPH.

NOTE The MASTER VOL and PASS SPKR VOL adjustments have no affect on sidetone volume.

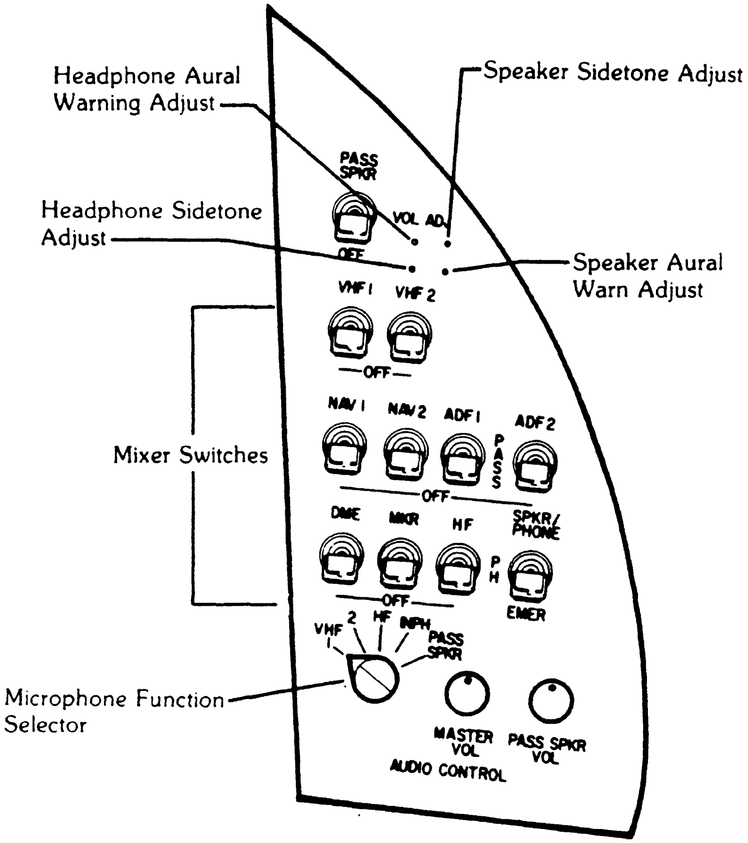
4. Aural Warning Volume — Two small holes are provided on the front of the Audio Control Panel (Figure 2-4) for insertion of a screwdriver to adjust speaker and phone aural warning volume. Aural warning volume adjustments should be made with the engines running.

AUDIO CONTROL SYSTEM PANEL (CONT)


Headphone Aural Warning Adjust
Speaker Sidetone Adjust
Headphone Sidetone Adjust
Speaker Aural Warn Adjust
Mixer Switches
Microphone Function Selector
PASS SPKR
VOL ADJ
OFF
VHF 1
VHF 2
OFF
NAV 1
NAV 2
ADF 1
ADF 2
PASS
OFF
DME
MKR
HF
SPKR/PHONE
PH
OFF
EMER
VHF 1
2
HF
INPH
PASS SPKR
PASS SPKR VOL
MASTER VOL
AUDIO CONTROL

PILOT'S AUDIO CONTROL PANEL
Figure 2-4 (Sheet 1 of 2)

AUDIO CONTROL SYSTEM PANEL (CONT)


Headphone Aural Warning Adjust
Speaker Sidetone Adjust
PASS SPKR
VOL ADJ
Headphone Sidetone Adjust
OFF
Speaker Aural Warn Adjust
VHF 1
VHF 2
OFF
NAV 1
NAV 2
ADF 1
ADF 2
PASS
Mixer Switches
OFF
DME
MKR
HF
SPKR/PHONE
PH
OFF
EMER
VHF 1
2
HF
INPH
PASS SPKR
Microphone Function Selector
MASTER VOL
PASS SPKR VOL
AUDIO CONTROL

COPILOT'S AUDIO CONTROL PANEL
Figure 2-4 (Sheet 2 of 2)

AUDIO CONTROL SYSTEM PANEL (CONT)

SPKR/PHONE-PH-EMER SWITCH

1. SPKR/PHONE Position — When the switch is in this position and any mixer switch is on, audio is fed to the headphones and cockpit speaker.
2. PH Position — When the switch is in this position and any mixer switch is on, audio is fed to the headphones only.
3. EMER Position — When the switch is in this position, audio is fed directly into the headphones, bypassing all AUDIO CONTROL Panel amplifiers.

MIXER SWITCHES

Ten mixer switches on the audio control panel are labeled and perform the following functions:

1. VHF 1 and VHF 2 Switches — When in the On (up) position, provide audio from the VHF 1 and VHF 2 transceivers respectively.
2. NAV 1 and NAV 2 Switches — When in the On (up) position, provide audio from the NAV 1 and NAV 2 receivers respectively.
3. ADF 1 and ADF 2 Switches — These are three position switches. The PASS (center) position provides audio to the passenger speaker when the PASS SPKR-VOL ADJ OFF switch is in the PASS SPKR position. The up position provides headphone and cockpit speaker audio only. When in the up position, these switches provide audio from the ADF 1 and ADF 2 receivers respectively. The up position is the normal mixer function.
4. DME Switch — When in the On (up) position, provides audio identification signals from the DME receiver.

NOTE

On aircraft equipped with dual DME, the number 1 DME audio will be provided by the pilot's Audio Control Panel and the number 2 DME audio will be provided by the copilot's Audio Control Panel.

5. MKR Switch — When in the On (up) position, provides "marker" audio from the marker beacon receiver.
6. HF Switch — When in the On (up) position, provides audio from HF transceiver (if installed).

AUDIO CONTROL SYSTEM PANEL (CONT)

7. PASS SPKR-VOL ADJ-OFF Switch — This is a three position switch and is used only when an ADF switch is set to PASS position; otherwise the switch should be in the OFF position.
    a. VOL ADJ position is used to monitor ADF audio over the cockpit speaker for adjustment with the PASS SPKR VOL control.
    b. PASS SPKR position transfers ADF audio from the cockpit speaker to passenger speaker and mutes ADF "mixer" audio to the cockpit speaker.

MICROPHONE FUNCTION SELECTOR

The Microphone Function Selector is a five-position rotary-type switch and is labeled VHF 1 and 2, HF, INPH, and PASS SPKR. This switch provides the proper microphone audio inputs for the five functions.

1. VHF 1, VHF 2, and HF Positions — When any of these positions are selected, microphone inputs are provided for the respective transceiver.
2. INPH Position — When this position is selected on one AUDIO CONTROL Panel, interphone is provided. If the opposite Microphone Function Selector is in the VHF 1 or 2, HF, or INPH position, audio will be provided to the opposite speaker and headphones. If the opposite Microphone Function Selector is in the PASS SPKR position, headphone audio only will be provided.
3. PASS SPKR Position — When this position is selected, the pilot or copilot, utilizing this function, may speak to the passengers through the passenger speaker. If ADF is being transmitted through the passenger speaker, it will automatically be disconnected when the Microphone Function Selector is in the PASS SPKR position. When the passenger speaker is in use, aural warning is automatically transferred to the cockpit speaker and not transmitted to the passengers.

AUDIO CONTROL SYSTEM PANEL (CONT)

FLIGHT OPERATION

1. MASTER VOL and PASS SPKR VOL Controls — Rotate to a comfortable listening level.
2. Applicable Mixer Switches — Set "on" (except PASS ADF) and adjust audio gain controls on each system for comfortable volume level.

NOTE The VHF 1 and VHF 2 volume controls do not affect sidetone levels. The HF volume control will affect the sidetone level on most models since audio and sidetone utilize a common line from the transceivers. Some HF transceivers do not have sidetone capabilities.

3. Microphone Function Selector — Rotate to desired position.
4. To provide ADF audio to the PASS SPKR:
   a. ADF 1 or ADF 2 (if installed) Mixer Switch — Set to PASS position.
   b. PASS SPKR-VOL ADJ Switch — Set to VOL ADJ.
   c. PASS SPKR VOL Control — Rotate to approximate "mid" position.
   d. Tune in desired station on ADF receiver and adjust cockpit speaker volume utilizing ADF system volume control.
   e. PASS SPKR-VOL ADJ Switch — Set to PASS SPKR. ADF audio will be transferred to passenger speakers.
   f. Adjust passenger speaker volume with PASS SPKR VOL control or ADF system volume control. The audio mixer inputs and microphone can be used in the normal manner but received audio will be through speaker and headphones.

EMERGENCY LIGHTING SYSTEM (IF INSTALLED) *Aircraft 35-067 thru 35-415 and aircraft 36-018 thru 36-047*

The emergency lighting system consists of two batteries, a wing inspection light, a door light, upper center panel lights, and three system switches. The system provides cabin lighting in the event of a failure of the normal electrical system and lighting for passenger egress through the emergency exit or cabin door. Switch function is as follows:

WING INSPECTION LIGHT

When the WING INSPECTION switch is set to ON, the wing inspection light on the right side of the fuselage below the emergency exit will illuminate. This light may be used to visually inspect the wing for ice accumulation or for illumination during passenger egress through the emergency exit.

EMER LT TEST-ARM-DISARM SWITCH

The EMER LT TEST-ARM-DISARM switch provides the test function for the system and for automatic illumination of the emergency lights in the event of an interruption of normal electrical power. For operation of the emergency lighting system, at least one aircraft battery switch must be in the On position prior to activating any of the EMER LT TEST-ARM- DISARM switch functions. Setting the switch to TEST simulates a power failure of the normal electrical system and illuminates the wing inspection light, door light, and upper center panel lights. Setting the switch to ARM will arm the system to illuminate the emergency lights in the event of a power failure of the normal electrical system. Setting the switch to DISARM isolates the emergency lights from the emergency power supply.

The switch should be set to ARM prior to takeoff. When the switch is in the DISARM position and the aircraft battery switches are On, an amber light adjacent to the switch will illuminate to indicate the switch should be set to ARM.

For normal operations, after landing, the switch must be set to DISARM prior to setting battery switches OFF.

EMER LTS-NORM SWITCH

The EMER LTS-NORM switch provides for manual illumination of the emergency lights. When the switch is set to EMER LTS, the wing inspection, cabin door, and upper center panel lights will illuminate. For normal operation, the switch should be set to NORM. Setting the switch to NORM does not hinder automatic illumination in the event of a power interruption of the normal electrical system.

EMERGENCY LIGHTING SYSTEM (IF INSTALLED) *Aircraft 35-416 & subsequent and aircraft 36-048 & subsequent*

The emergency lighting system consists of two batteries, an emergency exit light, a door light, upper center panel lights, and two system switches. The system provides cabin lighting in the event of a failure of the normal electrical system and lighting for passenger egress through the emergency exit or cabin door. Switch function is as follows:

EMER LT TEST-ARM-DISARM SWITCH

The EMER LT TEST-ARM-DISARM switch (pedestal) provides the test function for the system and for automatic illumination of the emergency lights in the event of an interruption of normal electrical power. For operation of the emergency lighting system, at least one aircraft battery switch must be in the On position prior to activating any of the EMER LT TEST- ARM-DISARM switch functions. Setting the switch to TEST simulates a power failure of the normal electrical system and illuminates the emergency exit light, door light, and upper center panel lights. Setting the switch to ARM will arm the system to illuminate the emergency lights in the event of a power failure of the normal electrical system. Setting the switch to DISARM isolates the emergency lights from the emergency power supply.

The switch should be set to ARM prior to takeoff. If the switch is in the DISARM position and the BATTERY switches are ON an amber light adjacent to the switch will illuminate to indicate the switch should be set to ARM.

For normal operations, after landing, the switch must be set to DISARM prior to setting battery switches OFF.

EMER LTS-NORM SWITCH

The EMER LTS-NORM switch (LH service cabinet) provides for manual illumination of the emergency lights. When the switch is set to EMER LTS, the emergency exit, cabin door, and upper center panel lights will illuminate. For normal operation, the switch should be set to NORM. Setting the switch to NORM does not hinder automatic illumination in the event of a power interruption of the normal electrical system.

ANNUNCIATOR PANEL

The annunciator panel lights may be tested by pressing the test switch under the glareshield which causes the lights to illuminate. Photoelectric cells, outboard of each FIRE PULL or ENG FIRE PULL T-Handle, automatically dim the lights to a level corresponding to existing light in the cockpit or to a minimum preset level for a totally dark cockpit. If an annunciator light illuminates and the condition is corrected, the light will extinguish. If the condition recurs, the light will again illuminate. Any time a red annunciator light illuminates, the MSTR WARN lights on the pilot's and copilot's instrument panel will also illuminate and flash. Depressing the MSTR WARN light will extinguish the MSTR WARN light, however, the annunciator light will remain on as long as the condition exists.

NOTE

For aircraft serials 35-067 thru 35-431 and 36-018 thru 36-049, the MSTR WARN light may not be resettable if:

1. SPOILER light is flashing.
2. Either FIRE PULL or ENG FIRE PULL T-Handle light is flashing.
3. L or R STALL light is flashing.

ENGINE SYNCHRONIZER

The engine synchronizer consists of the R ENG indicator, two ENG SYNC switches below the thrust levers, an amber ENG SYNC light on the glareshield annunciator panel, and an engine synchronizer control box. During flight, the engine synchronizer, if selected, will maintain the right engine Fan Speed (N_1) or Turbine Speed (N_2) in sync with left engine Fan Speed (N_1) or Turbine Speed (N_2). The engine synchronizer must not be used during takeoff, landing or during single-engine operations.

The amber ENG SYNC light will be illuminated whenever the nose gear is down and the ENG SYNC SYNC-OFF switch is in the SYNC position.

The R ENG indicator provides an indication of right engine synchronization with left engine Fan (N_1) or Turbine (N_2) speed. The indicator indicates fan sync when the ENG SYNC selector switch is in the FAN position and turbine sync when the selector switch is in the TURB position. The indicator can be used to manually synchronize the engine or to monitor operation of the automatic synchronizer. The indicator is operative whenever the right fuel computer is On and operative.

Automatic engine synchronization can be utilized whenever both fuel computers are On and operating and the ENG SYNC SYNC-OFF switch is set to SYNC. Since the engine synchronizer authority is limited, the operator should manually synchronize the desired parameter (N_1 or N_2) within approximately 2.5% before selecting SYNC.

NOTE The engine synchronizer also provides electrical filtering to prevent HF radio transmission interference with the engine fuel computers.

TRIM SYSTEMS OPERATIONAL CHECK

The following procedure performs the complete three-axis trim systems operational check. This check must be completed a minimum of once every 10 hours of flight operation.

NOTE

- Throughout the following checks, verify that the trim-in-motion audio clicker sounds approximately 1/4 second after initiating pitch trim with the flaps up. The trim-in-motion audio clicker will not sound when the flaps are lowered beyond 3°.
- The amber PITCH TRIM light on the glareshield annunciator panel will illuminate whenever either control wheel master switch (MSW) is depressed.

1. Battery Switches — On.
2. INVERTER Switch (PRI or SEC) — On.
3. Flaps — UP.
4. PITCH TRIM Selector Switch (pedestal) — SEC.
    a. NOSE DN-OFF-NOSE UP Switch (pedestal) — Check operation:
        (1) Operate switch NOSE UP and NOSE DN. Trim motion shall occur in both directions.
        (2) Check that depressing either control wheel master switch (MSW) while trimming NOSE UP or NOSE DN will stop trim motion while control wheel master switch (MSW) is held.
    b. Pilot's Control Wheel Trim Switch (arming button depressed) — Operate NOSE UP and NOSE DN. Trim motion shall not occur. Repeat using copilot's control wheel trim switch.
5. PITCH TRIM Selector Switch (pedestal) — OFF.
    a. NOSE DN-OFF-NOSE UP Switch (pedestal) — Operate NOSE UP and NOSE DN. Trim motion shall not occur.
    b. Pilot's Control Wheel Trim Switch (arming button depressed) — Operate NOSE UP and NOSE DN. Trim motion shall not occur. Repeat using copilot's control wheel trim switch.
6. PITCH TRIM Selector Switch (pedestal) — PRI.
    a. NOSE DN-OFF-NOSE UP Switch (pedestal) — Operate NOSE UP and NOSE DN. Trim motion shall not occur.
    b. Pilot's and copilot's Control Wheel Trim Switches — Check individually as follows:
        (1) Without depressing arming button, move switch NOSE UP, NOSE DN, LWD, and RWD. Trim motion shall not occur.
        (2) Depress arming button without displacing switch. Trim motion shall not occur.

TRIM SYSTEMS OPERATIONAL CHECK (CONT)

(3) Depress arming button and move switch NOSE UP, NOSE DN, LWD, and RWD. Trim motion shall occur in all directions.

(4) Check that depressing pilot's control wheel master switch (MSW) while trimming NOSE UP and NOSE DN will stop trim motion. Repeat step using copilot's control wheel master switch (MSW).

c. Trim by positioning copilot's control wheel trim switch. While trimming, trim in opposite direction using pilot's control wheel trim switch. Pilot's trim shall override copilot's trim. Repeat for each trim position.

7. Mach Trim — Check:

NOTE

- The Mach trim monitor compares horizontal stabilizer trim position with Mach number. During flight, the monitor will deactivate the Mach trim system (red MACH TRIM light will illuminate) in the event of a Mach number/horizontal stabilizer trim position error or in the event of a power loss to the Mach trim system. If the fault clears or power is restored, the system can be resynchronized with the TEST switch.
- During this check, the trim-in-motion audio clicker may or may not sound.

a. TEST Selector Switch — Rotate to MACH TRIM.

b. TEST Button — Depress and hold. The horizontal stabilizer should trim slowly in the nose-up direction for 1 to 3 seconds and then stop. The red MACH TRIM light will illuminate and the aural overspeed warning will sound.

c. TEST Button — Release. The MACH TRIM light will extinguish and the aural warning will cease.

8. Trim Speed and Trim Speed Monitor — Check:

NOTE

The trim speed monitor compares pitch trim rate with flap position. During flight, the monitor will illuminate the amber PITCH TRIM light to alert the flight crew that the aircraft is trimming at the high trim rate with the flaps up. During ground test, a flaps down signal is applied to the trim speed controller and a flaps up signal is applied to the trim speed monitor simulating the high trim rate with the trim speed monitor in the low trim rate mode.

TRIM SYSTEMS OPERATIONAL CHECK (CONT)

- *On aircraft incorporating AAK 83-2:*
  - a. While trimming NOSE UP or NOSE DN with either control wheel trim switch, actuate and hold TRIM OVSP-OFF-TRIM MON switch to TRIM OVSP. Amber PITCH TRIM light shall illuminate.
  - b. TRIM OVSP-OFF-TRIM MON Switch — Release.
  - c. Flaps — DN.
  - d. Either Control Wheel Trim Switch — NOSE UP or NOSE DN. Verify that PITCH TRIM indicator needle moves faster with the flaps down and trim-in-motion audio clicker does not sound.
- *On aircraft 35-408, 35-506 and Subsequent, 36-054 and Subsequent:*
  - a. TEST Selector Switch — Rotate to TRIM OVSP.
  - b. While trimming NOSE UP or NOSE DN with either Control Wheel Trim Switch, depress TEST button. Amber PITCH TRIM light shall illuminate.
  - c. TEST Button — Release.
  - d. Flaps — DN.
  - e. Either Control Wheel Trim Switch — NOSE UP or NOSE DN. Verify that PITCH TRIM indicator needle moves slower with flaps up and trim-in-motion audio clicker sounds.

9. Trim Monitor — Check.

NOTE

The trim monitor continuously monitors the primary pitch trim system for electrical faults which could cause a trim runaway if an additional fault were to occur. During flight, the trim monitor will illuminate the amber PITCH TRIM light to alert the crew a fault has occurred. During ground test, a signal simulating an electrical fault is applied to the trim monitor.

- *On aircraft incorporating AAK 83-2:*
  - a. TRIM OVSP-OFF-TRIM MON Switch — Actuate and hold to TRIM MON. Amber PITCH TRIM light shall illuminate.
  - b. TRIM OVSP-OFF-TRIM MON Switch — Release.
- *On aircraft 35-408, 35-506 and Subsequent; 36-054 and Subsequent:*
  - a. TEST Selector Switch — Rotate to TRIM MON.
  - b. TEST Button — Depress. Amber PITCH TRIM light shall illuminate.
  - c. TEST Button — Release.

TRIM SYSTEMS OPERATIONAL CHECK (CONT)

10. Either Control Wheel Trim Switch (arming button depressed) — Operate as required to move PITCH TRIM indicator pointer through the entire T.O. segment. The amber T.O. TRIM light shall be illuminated whenever indicator pointer is outside of T.O. segment and shall be extinguished whenever indicator pointer is within T.O. segment.
11. Rudder Trim Switch (pedestal) — Check operation as follows:
    a. Move each half of switch separately to NOSE LEFT and NOSE RIGHT. Trim motion shall not occur.
    b. Move both halves of switch simultaneously to NOSE LEFT and NOSE RIGHT. Trim motion shall occur.
12. INVERTER Switch — OFF.
13. Battery Switches — OFF.

SECTION III — EMERGENCY PROCEDURES

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INTRODUCTION TO EMERGENCY PROCEDURES

The procedures in this section of the manual have been developed by Learjet Inc. for certification of this aircraft. This section contains those operating procedures requiring the use of special systems and/or regular systems in order to protect the occupants and the aircraft from harm during a critical situation requiring immediate response. Procedures or parts of procedures in this section emphasized by enclosure in a box such as this ⬚ should be accomplished without reference to this manual.

The procedures located in this section supplement Normal Procedures when an emergency condition exists. Use of Normal Procedures should be continued when applicable. Sound judgement, as well as thorough knowledge of the aircraft, its characteristics, and the flight manual procedures are essential in the handling of any emergency situation.

OVERRIDING CONSIDERATIONS

In all emergencies, the overriding consideration must be to:

- Maintain Airplane Control
- Analyze the Situation
- Take Proper Action

TERMINOLOGY

Many emergencies require some urgency in landing the aircraft. The degree of urgency required varies with the emergency; therefore, the terms "land as soon as possible" and "land as soon as practical" are employed. These terms are defined as follows:

Land as soon as possible — A landing should be accomplished at the nearest suitable airfield considering the severity of the emergency, weather conditions, field facilities, ambient lighting, and aircraft gross weight.

Land as soon as practical — Emergency conditions are less urgent, and although the mission is to be terminated, the degree of the emergency is such that an immediate landing at the nearest adequate airfield may not be necessary.

COMPLETE AC POWER FAILURE — LOSS OF ALL INVERTERS

1. Maintain aircraft control by reference to the emergency attitude gyro.
2. Avoid flight in instrument weather conditions.
3. AC BUS TIE Circuit Breaker (copilot's panel) — Pull, if not open.
4. INV (main power bus) and AC BUS (ac bus) Circuit Breakers — Reset, if open.
5. Reduce AC load.
6. INVERTER Switches — OFF, then On.

If AC power is not regained:

7. INV Circuit Breakers — Pull and reset.
8. If AC power is not regained, the following partial list of equipment will **not** be usable:
    a. Vertical and directional gyros.
    b. Autopilot and yaw dampers.
    c. Mach Trim System.
    d. Avionics displays.
    e. Electrical servoed altimeter(s).
    f. Engine oil pressure indicators.
    g. Spoilerons.
    h. Spoilers (inoperative in flight only).

NOTE Spoilers will operate normally on ground.

    i. Nose wheel steering.
    j. Electric windshield defog *(Aircraft 35-671 & subsequent and 36-064 & subsequent).*
9. Mach Trim will be inoperative. **Do not exceed MMO (0.74 MI).**
10. Maintaining not less than 250 KIAS until approach will improve stability.

BATTERY OVERHEAT
(Aircraft with Nickel-Cadmium Batteries)

NOTE If either BAT 140 or BAT 160 light illuminates during flight, both batteries must be checked per Chapter 12 of the Maintenance Manual after landing.

BAT 140 LIGHT ILLUMINATED

1. BAT TEMP Indicator — Monitor to determine affected battery.
2. Affected Battery Switch — OFF.
3. Land as soon as practical.

BAT 160 LIGHT ILLUMINATED

1. BAT TEMP Indicator — Monitor to determine affected battery.
2. Affected Battery Switch — OFF.
3. Land as soon as possible.

CURRENT LIMITER FAILURE/ILLUMINATION OF CUR LIM (CUR LIMITER) LIGHT IN FLIGHT

A battery charging bus current limiter (275-amp) failure is evidenced by illumination of the red CUR LIM light (*aircraft 35-370, 35-390 and subsequent and aircraft 36-048 and subsequent*) or amber L CUR LIMITER or R CUR LIMITER light (*aircraft 35-067 thru 35-389 except 35-370 and 36-018 thru 36-047 incorporating AMK 80-17 or AAK 81-1*), or failure to successfully complete the battery charging bus current limiter check after a starter-assist airstart. Should a battery charging bus current limiter fail:

1. DC Voltmeter — Check. Failure of both 275-amp current limiters is indicated when the DC voltmeter indicates battery voltage (25 volts or less).
2. • **If one 275-amp current limiter has failed:**
    a. Electrical Load — Reduce if required to observe generator limits.
    b. Continue flight but monitor electrical loads.

    • **If both 275-amp current limiters have failed — *Aircraft 35-067 thru 35-508 and 36-018 thru 36-053 when not incorporating AMK 85-1:***
    a. Electrical Load — Reduce.

NOTE Electrical power to the essential buses is being supplied by the ship's batteries. All nonessential equipment should be turned off or circuit breakers pulled. Fully charged batteries should power the minimum electrical equipment for night instrument flight for approximately 30 minutes.

    b. Land as soon as practical.

    • **If both 275-amp current limiters have failed — *Aircraft 35-509 and subsequent and 36-054 and subsequent and prior aircraft incorporating AMK 85-1:***
    a. COOL-FAN Switch — OFF.
    b. *On aircraft incorporating AAK 86-1 or SB 35/36-21-17,* W/S AUX HEAT DEFOG Switch — OFF.
    c. RECOG LT Switch — OFF.
    d. AUX HT Switch (if installed) — OFF.

NOTE Electrical power to the battery charging bus is being supplied by the ship's batteries. If the batteries should become depleted, primary pitch trim and stall warning systems will be inoperative.

3. After landing, replace failed 275-amp current limiter(s) prior to next flight.

DC POWER LOSS — ESSENTIAL BUS (Aircraft 35-067 thru 35-201, 35-205, and aircraft 36-018 thru 36-040 except when these aircraft incorporate AMK 78-13)

The pilot's and copilot's essential buses are tied together through the ESS BUS TIE Circuit Breaker located on the copilot's circuit breaker panel.

Upon loss of either ESS BUS Circuit Breaker, the ESS BUS TIE Circuit Breaker will normally open also. The open ESS BUS TIE Circuit Breaker will isolate the pilot's and copilot's essential buses.

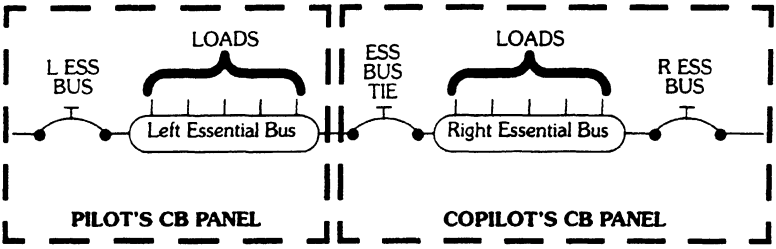

Figure 3-1

IF AN ESS BUS CIRCUIT BREAKER OPENS IN FLIGHT:

Affected Essential Bus:

1. ESS BUS TIE Circuit Breaker (copilot's panel) — Pull, if not already open.

NOTE Do not reset the ESS BUS TIE Circuit Breaker.

2. Essential Bus electrical load — Reduce as follows:
   a. AUTOPILOT Switch — OFF.
   b. Instrument panel light rheostats — OFF if conditions permit.
   c. Restrict operation of the following systems to one at a time.
      (1) Pitch, roll and yaw trims.
      (2) Communication transmissions.
      (3) Fuel transfer and standby pumps.
      (4) Flaps.
      (5) Landing Gear.
3. ESS BUS Circuit Breaker — Reset.

DC POWER LOSS — ESSENTIAL BUS (Aircraft 35-067 thru 35-201, 35-205, and aircraft 36-018 thru 36-040 except when these aircraft incorporate AMK 78-13) (CONT)

If ESS BUS Circuit Breaker Does Not Hold:

4. Wait at least one minute before attempting reset.

If ESS BUS Circuit Breaker Holds After Being Reset:

5. Add loads only as necessary for safe operation.

NOTE Do not reset the open ESS BUS TIE Circuit Breaker.

If ESS BUS Circuit Breaker Opens Again:

6. Essential Bus Electrical Load — Reduce as follows:
   a. AUTOPILOT Switch — OFF.
   b. Select PH on both audio panels (use headphones for communication).
   c. Instrument panel light rheostats — OFF if conditions permit.
   d. Restrict operation of the following systems to one at a time.
      (1) Pitch, roll and yaw trims.
      (2) Communication transmissions.
      (3) Fuel transfer and standby pumps.
      (4) Flaps.
      (5) Landing Gear.
   e. Pull the following circuit breakers on the failed essential bus.
      (1) COMM.
      (2) S WARN HT.
      (3) PITOT HT.
      (4) Yaw damper.
   f. Select the following primary or secondary systems for operation from the remaining essential bus.
      (1) Pitch trim.
      (2) ATC transponder (if dual).
      (3) COMM 1 or COMM 2.
      (4) Yaw damper.
   g. ESS BUS TIE Circuit Breaker (copilot's panel) — Reset.

NOTE Cross-check airspeed/Mach, altitude and angle-of-attack displays against opposite system on frequent basis. Use reference from system on remaining essential bus if differences exist and icing conditions are present.

DC POWER LOSS — ESSENTIAL BUS (Aircraft 35-202 thru 35-204, 35-206 & subsequent, aircraft 36-041 & subsequent, and prior aircraft incorporating AMK 78-13)

The pilot's and copilot's Essential A and Essential B Buses are tied together through the ESS A BUS TIE and ESS B BUS TIE Circuit Breakers (copilot's panel) respectively.

Upon loss of one ESS BUS Circuit Breaker, the corresponding ESS BUS TIE Circuit Breaker will normally open also. The open ESS BUS TIE Circuit Breaker will isolate the pilot's and copilot's essential buses.

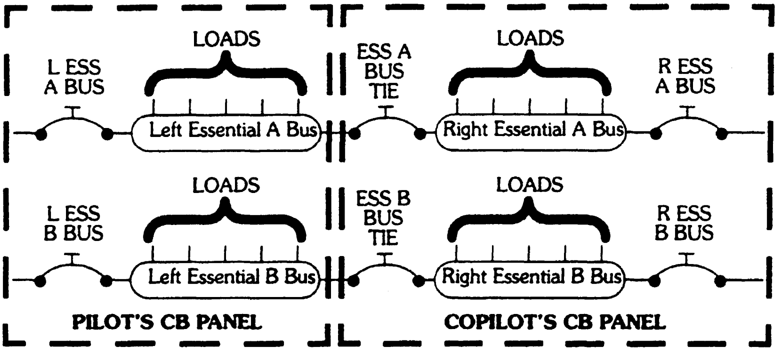
LOADS
L ESS A BUS
Left Essential A Bus
ESS A BUS TIE
LOADS
Right Essential A Bus
R ESS A BUS
LOADS
L ESS B BUS
Left Essential B Bus
ESS B BUS TIE
LOADS
Right Essential B Bus
R ESS B BUS
PILOT'S CB PANEL
COPILOT'S CB PANEL

Figure 3-2

IF AN ESS BUS CIRCUIT BREAKER OPENS IN FLIGHT:

Affected Essential Bus:

1. ESS BUS TIE Circuit Breaker (copilot's panel) — Pull, if not already open.

NOTE Do not reset the ESS BUS TIE Circuit Breaker.

2. Essential Bus electrical load — Reduce by pulling unnecessary systems circuit breaker.

NOTE Essential bus system loads are protected by circuit breakers on the same row as the essential bus circuit breaker.

3. ESS BUS Circuit Breaker — Reset.

DC POWER LOSS — ESSENTIAL BUS (Aircraft 35-202 thru 35-204, 35-206 & subsequent, aircraft 36-041 & subsequent, and prior aircraft incorporating AMK 78-13) (CONT)

4. Restrict operation of the following systems to one at a time.
    a. Pitch, roll and yaw trims.
    b. Fuel transfer and standby pumps.
    c. Flaps.
    d. Landing gear.

If ESS BUS Circuit Breaker Does Not Hold:

5. Wait at least one minute before attempting reset.

If ESS BUS Circuit Breaker Holds After Being Reset:

6. Add loads only as necessary for safe operation.

NOTE Do not reset ESS BUS TIE Circuit Breaker.

If ESS BUS Circuit Breaker Opens Again:

7. Reduce electrical load on essential bus to a minimum.
8. ESS BUS Circuit Breaker — Reset.

If ESS BUS Circuit Breaker Will Not Stay Closed and It Is Desired To Operate A Load Connected To That Bus Only:

9. Reduce loads on both affected ESS BUS Circuit Breakers to a minimum.
10. ESS BUS TIE Circuit Breaker (copilot's panel) — Reset.
11. If the ESS BUS TIE Circuit Breaker opens, leave open.

NOTE Cross-check airspeed/Mach, altitude, and angle-of-attack displays against opposite system on a frequent basis. Use references from systems on opposite essential bus if differences exist and icing conditions are present.

DUAL GENERATOR FAILURE

1. Electrical Load — Reduce.
    a. COOL-FAN Switch — OFF.
    b. AUX HT Switch (if installed) — OFF.
    c. W/S AUX DEFOG HEAT Switch (if installed) — OFF.
2. L and R IGN & ST Circuit Breakers (main power bus) — Check and reset.
3. START-GEN Switches — GEN.

NOTE START-GEN switch must be in GEN for the respective generator RESET switch to be effective.

4. GEN RESET Switches — Depress momentarily.

CAUTION Depressing and holding the GEN RESET switch longer than one-half second, or multiple activations, may cause damage to the electrical system.

If generators do not reset:

5. Turbine Speed (N_2) — 80% RPM or above.
6. START-GEN Switches — OFF, then GEN.
7. GEN RESET Switches — Depress momentarily.

CAUTION Depressing and holding the GEN RESET switch longer than one-half second, or multiple activations, may cause damage to the electrical system.

If generators do not reset:

8. START-GEN Switches — OFF.
9. JET PUMP Switches — Check, ON.
10. Both FUEL CMPTR Switches — OFF, one at a time. Control engines manually.

CAUTION

- Engine response will be much slower with the fuel computers OFF.
- Monitor Fan Speed (N_1) indicators. If an engine accelerates uncontrolled, immediately set applicable FUEL CMPTR switch(es) — On.

11. If there is fuel in the fuselage tank:
    - Aircraft not equipped with FUS VALVE switch:
        a. FUS TANK XFER-FILL Switch — XFER.
        b. FUSLG PMP Circuit Breaker (copilot's main bus) — Pull.
    - Aircraft equipped with FUS VALVE switch:
        a. FUS VALVE Switch — OPEN.

NOTE Approximately 162 pounds of fuselage fuel will be unusable.

12. Land as soon as practical.

DUAL GENERATOR FAILURE (CONT)

13. Electrical power will be supplied by the ship's batteries. All nonessential equipment should be turned off or circuit breakers pulled. Fully charged batteries should power the minimum electrical equipment for night instrument flight for approximately 30 minutes.

If Ship's Batteries are Depleted:

14. If the ship's batteries are depleted, the only electrical power available will be from the Emergency Power Supply.
    a. EMER BAT or EMER PWR Switch — STBY.
    b. EMER BAT or EMER PWR Switch — On, prior to operating gear or flaps.

EQUIPMENT AND TOTAL OPERATING TIME
FOR SINGLE INSTALLATION

Switch Position	Third Attitude Gyro	Gear	Flaps	Operating Time
ON	●	●	●	30 minutes
STBY	●			3 hrs. 45 min.

15. Second EMER PWR Switch (if installed) — On.

NOTE

The equipment powered by the second Emergency Power Supply is dependent upon owner preference. The operating time for the second Emergency Power Supply will vary with the amount of equipment powered and the total electrical draw of that equipment.

16. The following is a list of conditions that will exist:
    a. Flight control trim will remain at its last setting.
    b. All engine instruments will be inoperative or unreliable.
    c. The engines will revert to the fuel computer off (manual) mode of operation.

NOTE

Engine response is much slower with the engine fuel computer OFF and response may be hard to detect with engine instruments inoperative.

    d. • *On aircraft 35-067 thru 35-112 except 35-107. 36-018 thru 36-031,* pressurization AUTO mode will not be affected and cabin temperature will remain at the last setting.

DUAL GENERATOR FAILURE (CONT)

- *On aircraft 35-107, 35-113 and subsequent, and 36-032 and subsequent*, the emergency pressurization valves will reposition to emergency. Bleed-air for wing, windshield, and stabilizer anti-ice as well as temperature control will not be available. Pressurization AUTO mode will not be affected.

e. Autopilot and yaw dampers will be inoperative.

f. The jet pumps will supply fuel to the engines. Fuel system valves will remain in their last position.

g. Fuel Quantity, Fuel Flow, and Fuel Counter indicators will be inoperative.

h. Mach Trim and stick puller will be inoperative. **Do not exceed MMO (0.74 MI)**.

i. All AC electrical systems will be inoperative.

j. Spoilers will be inoperative.

k. Stall warning system will be inoperative. Maintain adequate margin above stall speed by reference to the airspeed indicator.

l. Engine fire detect and extinguishing systems will be inoperative.

m. Nose wheel steering and anti-skid will be inoperative for landing. Refer to Section V for increased landing distance requirements.

ENGINE FAILURE

DURING TAKEOFF

BELOW V_1 SPEED

1. **Thrust Levers — IDLE.**
2. **Wheel Brakes — Apply.**
3. **Spoilers — EXT.**
4. Drag Chute or Thrust Reversers (if installed) — Deploy, if necessary.

ABOVE V_1 SPEED

1. **Rudder and Ailerons — As required, for directional control.**
2. **Accelerate to V_R.**

NOTE **Directional control is improved if the nose wheel is kept on the runway until V_R.**

3. **Rotate at V_R; Climb at V_2.**
4. **GEAR — UP, when positive rate of climb is established.**
5. **When clear of obstacles, accelerate to V_2 + 30 and retract flaps.**

NOTE Lateral control is improved with tip tanks empty. If time permits, it is recommended that tip tank fuel be jettisoned.

6. FUEL JTSN Switch — ON (lights on); Off prior to touchdown. Time to reduce aircraft weight from maximum takeoff weight to maximum landing weight is approximately 40 minutes. Time to jettison fuel from tip tanks is approximately 5 minutes.
7. Refer to ENGINE SHUTDOWN IN FLIGHT procedure, Section IV, or ENGINE FIRE — SHUTDOWN procedure, this section.

ENGINE FAILURE (CONT)

IN FLIGHT

1. Control Wheel Master Switch (MSW) — Depress and release. Yaw damper and autopilot will disengage.
2. Rudder and Ailerons — As required, for directional control.
3. Thrust Lever (operative engine) — Increase as required.
4. ENG SYNC Switch — OFF.
5. Rudder Trim — As required.
6. Yaw Damper — Engage.
7. Autopilot — As desired.
8. Refer to ENGINE SHUTDOWN IN FLIGHT procedure, Section IV.

DURING APPROACH

1. **Control Wheel Master Switch (MSW) — Depress and release. Yaw damper and autopilot will disengage.**
2. **Thrust Lever (operative engine) — Increase as required.**
3. **Flaps — 20° maximum.**

NOTE **If aircraft is configured with landing flaps (DN) when engine failure occurs, thrust increase (on operative engine) and flap retraction to 20° should be near simultaneous actions.**

4. **Airspeed — VREF + 10 minimum.**
5. Rudder Trim — As required.

NOTE During a coupled approach, full rudder trim may be required with an actual engine failure. Use rudder pedal force as necessary to maintain slip indicator ball centered.

6. Yaw Damper — Engage.
7. Autopilot — As desired.
8. Refer to either of the following procedures as applicable:
   - SINGLE-ENGINE LANDING, Section IV.
   - GO AROUND, Section II, and ENGINE SHUTDOWN IN FLIGHT, Section IV.

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ENGINE FIRE — SHUTDOWN

NOTE: An engine fire is usually accompanied by other indications, such as: excessive Turbine Temperature (ITT), erratic or rough engine operation, fluctuating engine indications, or smoke in the cabin.

Affected Engine:

1. **Thrust Lever — IDLE, unless a critical thrust situation exists.**
2. **• If fire continues more than 15 seconds or there are other indications of fire:**
   - a. **Thrust Lever — CUTOFF.**
   - b. **FIRE PULL or ENG FIRE PULL T-Handle — Pull.**

   NOTE: **Pulling the FIRE PULL or ENG FIRE PULL T-Handle stops the flow of fuel and hydraulic fluid to the engine, shuts off bleed air from the engine, and arms the fire extinguishing system.**

   - c. **ARMED Light — Depress one.**
   - d. • **If fire continues:**
     - (1) Depress remaining ARMED light.
     - (2) Land as soon as possible.
     - (3) Go to step e.

     • **If fire extinguishes:**
     - (1) Land as soon as practical.
     - (2) Go to step e.
   - e. AIR IGN Switch — OFF.
   - f. ENG SYNC Switch — OFF.
   - g. Yaw Damper — OFF, retrim as desired; then Yaw Damper — Engage.
   - h. JET PUMP Switch — Off; STANDBY PUMP Switch — Off.
   - i. START-GEN Switch — OFF.
   - j. Electrical Load — Reduce.

   CAUTION: During single-engine operation, the COOL-FAN switch should be placed to the OFF position in order to prevent overloading the operating generator.

   - k. CROSSFLOW Switch — OPEN. Monitor fuel balance. Crossflow as required.

   NOTE: During single-engine operation, maintain slip indicator ball centered.

   - l. Refer to SINGLE-ENGINE LANDING, Section IV.

ENGINE FIRE — SHUTDOWN (CONT)

- **If fire extinguishes in less than 15 seconds:**

a. Leave thrust lever at IDLE, unless a critical thrust situation exists.
b. ENG SYNC Switch — OFF.
c. Yaw Damper — OFF, retrim as desired; then Yaw Damper — Engage.
d. Monitor fuel balance. Crossflow as required.
e. Land as soon as practical.
f. Refer to SINGLE-ENGINE LANDING, Section IV.

ENGINE AIRSTARTS

The following information is applicable to **all** airstart procedures.

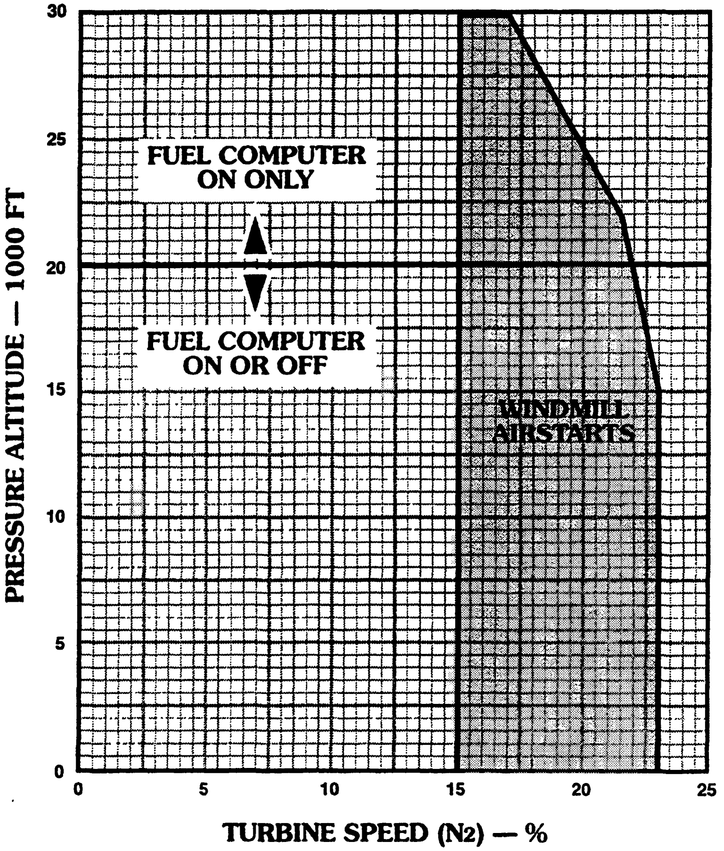
WARNING

Do not attempt an airstart following an engine failure which was accompanied by indications of internal engine damage or fire.

CAUTION

- **Do not** attempt an airstart without an indication of fan rotation.
- If Turbine Temperature (ITT) is approaching the limit and rising rapidly, immediately place thrust lever in CUTOFF position and abort start.
- At least one inverter must be operating to energize oil pressure indicator. If oil pressure is not indicated within 10 seconds, abort start.
- If the malfunction is isolated to the fuel computer, use FUEL COMPUTER OFF starting procedure and remain in the FUEL COMPUTER OFF mode for remainder of the flight.

RELIGHT ENVELOPE



- Fuel computer ON starter-assist airstarts may be made at any stabilized Turbine Speed (N2) up to 45% and any altitude up to 30,000 feet.
- Maintaining an airspeed which will maintain a minimum stabilized Turbine Speed (N2) of 15% RPM will enhance airstart capability.
- **Do not** attempt fuel computer OFF airstart above 20,000 feet.

Figure 3-3

ENGINE AIRSTARTS (CONT)

STARTER-ASSIST AIRSTART (FUEL COMPUTER ON)

CAUTION

- Starter-assist airstarts may be used at any Turbine Speed (N2) below 45%. Starter-assist airstarts must be used when stabilized Turbine Speed (N2) is below 15%.
- Maintaining an airspeed sufficient to maintain a stabilized Turbine Speed (N2) of 15% minimum will enhance airstart capability.

Affected Engine:

1. Ensure that aircraft is within RELIGHT ENVELOPE as shown in Figure 3-3, this section, if conditions permit.
2. Thrust Lever — CUTOFF. Wait 10 seconds to allow fuel to drain from engine.
3. Fuel Supply — Check.
    a. Fuel available from wing tank.
    b. FIRE PULL or ENG FIRE PULL T-Handle — Push in.
4. Fuel Panel Switches — As follows:
    a. Either JET PUMP Switch or STANDBY PUMP Switch — Check, ON.
    b. CROSSFLOW Switch — CLOSE.
    c. FUS TANK XFER-FILL Switch — OFF.
    d. FUS VALVE Switch (if installed) — CLOSE.
5. Electrical Load — Reduce.
6. NAC HEAT Switch — OFF.
7. BLEED AIR Switch — OFF.
8. START-GEN Switch — START. Starter engaged light (if installed) will illuminate.
9. Thrust Lever (at minimum 10% Turbine Speed [N2] and indication of Fan Speed [N1] rotation) — IDLE.
10. AIR IGN Light and FUEL FLOW — Check.
11. Turbine Temp (ITT) — Check rise within 5 seconds.
12. If light-off has not occurred within 5 seconds after the thrust lever is placed in IDLE position; SPR Switch — Energize, then release at 300°-400° Turbine Temp (ITT). Check rise within 5 seconds.
13. At approximately 45% or 50% Turbine Speed (N2), the starter will automatically disengage. Check:
    a. AIR IGN Light — Extinguished.
    b. Starter Engaged Light (if installed) — Extinguished. If starter engaged light remains illuminated, refer to STARTER ENGAGED LIGHT REMAINS ILLUMINATED AFTER START, Section IV.

ENGINE AIRSTARTS (CONT)

14. START-GEN Switch — GEN at idle.
15. Engine Instruments — Normal indications.
16. BLEED AIR Switch — On.
17. NAC HEAT Switch — On as required.

If No Indication of Light Off is Obtained in 10 Seconds:

18. Thrust Lever — CUTOFF.
19. START-GEN Switch — OFF.
20. Repeat STARTER-ASSIST AIRSTART (FUEL COMPUTER ON) procedure.

CAUTION No more than three consecutive starter-assist airstarts should be attempted to prevent severe battery drain and generator burnout.

If Engine Will Not Restart:

21. Perform WINDMILLING AIRSTART (FUEL COMPUTER ON) procedure, this section.

After Both Engines Are Operating:

22. *On aircraft 35-067 thru 35-389 except 35-370 and aircraft 36-018 thru 36-047 except aircraft incorporating AMK 80-17 or AAK 81-1,* Starter Disengagement Check:
    a. AUX HT (if installed) and COOL-FAN Switches — OFF.
    b. Battery Switches — OFF.
    c. Ammeter — Check total current indication is less than 100 amps.
        - If total current indication is greater than 100 amps:
            (1) Battery Switches — On.
            (2) Land as soon as practical.
            (3) **Do not** attempt further flights until trouble has been corrected.

NOTE A total ammeter indication greater than 100 amps indicates that a starter has not disengaged and subsequent starter and/or engine damage may occur.

        - If total current indication is less than 100 amps; set battery switches — On.

ENGINE AIRSTARTS (CONT)

23. Battery Charging Bus Current Limiter Check:

CAUTION Failure to successfully complete the following current limiter checks indicates a malfunction. In this event, refer to CURRENT LIMITER FAILURE/ILLUMINATION OF CUR LIM (CUR LIMITER) LIGHT IN FLIGHT procedure, this section.

- *Aircraft 35-067 thru 35-147 and aircraft 36-018 thru 36-035 except aircraft incorporating AMK 80-17 or AAK 81-1:*
  - a. MAIN BUS TIE Circuit Breaker (copilot's panel) — Pull.
  - b. One START-GEN Switch — OFF. Check ammeter reading on opposite generator, approximately doubles, then switch back to GEN.
  - c. Opposite START-GEN Switch — OFF. Check ammeter reading on opposite generator, approximately doubles, then switch back to GEN.
  - d. MAIN BUS TIE Circuit Breaker — Reset.

- *Aircraft 35-148 thru 35-389 except 35-370 and aircraft 36-036 thru 36-047 except aircraft incorporating AMK 80-17 or AAK 81-1:*
  - a. TEST Selector Switch — Rotate to L CUR LIM.
  - b. TEST Button — Depress. Green current limiter light will illuminate and remain on while button is held. L GEN light will illuminate and right generator voltage may be reduced approximately 2 vdc.
  - c. TEST Selector Switch — Rotate to R CUR LIM.
  - d. TEST Button — Depress. Green current limiter light will illuminate and remain on while button is held. R GEN light will illuminate and left generator voltage may be reduced approximately 2 vdc.

- *Aircraft 35-067 thru 35-389 except 35-370 and 36-018 thru 36-047 incorporating AMK 80-17 or AAK 81-1:*
  - a. L CUR LIMITER and R CUR LIMITER Lights — Check extinguished.

- *Aircraft 35-370, 35-390 and subsequent and aircraft 36-048 and subsequent:*
  - a. CUR LIM Light — Check extinguished.

ENGINE AIRSTARTS (CONT)

WINDMILLING AIRSTART (FUEL COMPUTER ON)

CAUTION

Do not attempt windmilling airstart with fuel computer ON unless airspeed is sufficient to maintain a stabilized Turbine Speed (N2) of 15% minimum and indication of fan rotation. Starter assist airstarts **must** be used when stabilized Turbine Speed (N2) is below 15%.

Affected Engine:

1. Ensure that aircraft is within RELIGHT ENVELOPE as shown in Figure 3-3, this section.
2. Thrust Lever — CUTOFF. Wait 10 seconds to allow fuel to drain from engine.
3. Fuel Supply — Check.
    a. Fuel available from wing tank.
    b. FIRE PULL or ENG FIRE PULL T-Handle — Push in.
4. Fuel Panel Switches — As follows:
    a. JET PUMP Switch — ON.
    b. STANDBY PUMP Switch — ON.
    c. CROSSFLOW Valve — CLOSED.
    d. FUS TANK XFER-FILL Switch — OFF.
    e. FUS VALVE (if installed) — CLOSED.
5. START-GEN Switch — OFF.
6. Electrical Load — Reduce.
7. NAC HEAT Switch — OFF.
8. BLEED AIR Switch — OFF.
9. AIR IGN Switch — ON, check AIR IGN light illuminated.
10. Thrust Lever — IDLE. Check FUEL FLOW indication.
11. Turbine Temp (ITT) — Check rise within 5 seconds.
12. If light-off has not occurred within 5 seconds after the thrust lever is placed in IDLE position; SPR Switch — Energize, then release at 300°-400° Turbine Temp (ITT). Check rise within 5 seconds.
13. AIR IGN Switch — OFF at 45% Turbine Speed (N2). Check AIR IGN light extinguished.
14. START-GEN Switch — GEN at idle.
15. Engine Instruments — Normal indications.
16. STANDBY PUMP Switch — Off.
17. BLEED AIR Switch — ON.
18. NAC HEAT Switch — On as required.

ENGINE AIRSTARTS (CONT)

If No Indication of Light-Off Is Obtained in 10 Seconds:

19. Thrust Lever — Cutoff.
20. AIR IGN Switch — OFF.
21. Repeat WINDMILLING AIRSTART (FUEL COMPUTER ON) or STARTER-ASSIST AIRSTART (FUEL COMPUTER ON) procedure.

If Engine Will Not Restart:

22. Perform ENGINE SHUTDOWN IN FLIGHT procedure, Section IV.

ENGINE AIRSTARTS (CONT)

STARTER-ASSIST AIRSTART (FUEL COMPUTER OFF)

CAUTION

- Fuel computer OFF airstarts should **only** be attempted when fuel computer ON operation is not available.
- Starter-assist airstarts may be used at any Turbine Speed (N2) below 45%. Starter-assist airstarts **must** be used when stabilized Turbine Speed (N2) is below 15%.
- Maintaining an airspeed sufficient to maintain a stabilized Turbine Speed (N2) of 15% or above will enhance airstart capability.

Affected Engine:

1. Ensure that aircraft is within RELIGHT ENVELOPE (below 20,000 feet) as shown in Figure 3-3, this section, if conditions permit.
2. FUEL CMPTR Switch — OFF.
3. Thrust Lever — CUTOFF. Wait 10 seconds to allow fuel to drain from engine.
4. Fuel Supply — Check.
   a. Fuel available from wing tank.
   b. FIRE PULL or ENG FIRE PULL T-Handle — Push in.
5. Fuel Panel Switches — As follows:
   a. STANDBY PUMP Switch — ON.
   b. JET PUMP Switch — Off.
   c. CROSSFLOW Valve — CLOSED.
   d. FUS TANK XFER-FILL Switch — OFF.
   e. FUS VALVE (if installed) — CLOSED.
6. Electrical Load — Reduce.
7. NAC HEAT Switch — OFF.
8. BLEED AIR Switch — OFF.
9. START-GEN Switch — START. Starter engaged light (if installed) will illuminate.
10. Thrust Lever (at 10% Turbine Speed [N2] and indication of Fan Speed [N1] rotation) — IDLE.
11. AIR IGN Light and FUEL FLOW — Check.
12. Turbine Temp (ITT) — Check rise within 10 seconds.

CAUTION

- If light-off has not occurred within 10 seconds after Thrust Lever is placed in IDLE, abort start.
- If engine accelerates above 80% Fan Speed (N1) with Thrust Lever in IDLE, abort start.

ENGINE AIRSTARTS (CONT)

13. START-GEN Switch — GEN at 45% Turbine Speed (N2).

CAUTION

Set Starter-Generator Switch to OFF or GEN at 45% Turbine Speed (N2) since there is no overspeed protection for the starter. The fuel computer speed switch function is inoperative during fuel computer off mode of operation.

14. After START GEN Switch is set to GEN, check:
    a. AIR IGN Light — Extinguished.
    b. Starter Engaged Light (if installed) — Extinguished. If starter engaged light remains illuminated, refer to STARTER ENGAGED LIGHT REMAINS ILLUMINATED AFTER START, Section IV.
15. Engine Instruments — Normal indications. (Monitor. Fuel computer limiting functions are inoperative in fuel computer OFF mode of operation.)
16. BLEED AIR Switch — ON.
17. NAC HEAT Switch — On as required.

If No Indication of Light Off is Obtained in 10 Seconds:

18. Thrust Lever — CUTOFF.
19. START-GEN Switch — OFF.
20. Repeat STARTER-ASSIST AIRSTART (FUEL COMPUTER OFF) procedure.

CAUTION

Not more than three consecutive starter-assist airstarts should be attempted to prevent severe battery drain and generator burnout.

If Engine Will Not Restart:

21. Perform WINDMILLING AIRSTART (FUEL COMPUTER OFF) procedure, this section.

After Both Engines Are Operating:

22. *On aircraft 35-067 thru 35-389 except 35-370; and 36-018 thru 36-047 except aircraft incorporating AMK 80-17 or AAK 81-1,* Starter Disengagement Check:
    a. AUX HT (if installed) and COOL-FAN Switches — OFF.
    b. Battery Switches — OFF.
    c. Ammeter — Check total current indication less than 100 amps.

ENGINE AIRSTARTS (CONT)

- If total current indication is greater than 100 amps:
  (1) Battery Switches — On.
  (2) Land as soon as practical.
  (3) Do not attempt further flights until trouble has been corrected.

NOTE

> A total ammeter indication greater than 100 amps indicates that a starter has not disengaged and subsequent starter and/or engine damage may occur.

- If total current indication is less than 100 amps; set Battery Switches — On.

23. Battery Charging Bus Current Limiter Check:

CAUTION

> Failure to successfully complete the following current limiter checks indicates a malfunction. In this event, refer to CURRENT LIMITER FAILURE/ILLUMINATION OF CUR LIM (CUR LIMITER) LIGHT IN FLIGHT procedure, this section.

- *Aircraft 35-067 thru 35-147 and aircraft 36-018 thru 36-035 except aircraft incorporating AMK 80-17 or AAK 81-1:*
  a. MAIN BUS TIE Circuit Breaker (copilot's panel) — Pull.
  b. One START-GEN Switch — OFF. Check ammeter reading on opposite generator, approximately doubles, then switch back to GEN.
  c. Opposite START-GEN Switch — OFF. Check ammeter reading on opposite generator, approximately doubles, then switch back to GEN.
  d. MAIN BUS TIE Circuit Breaker — Reset.

- *Aircraft 35-148 thru 35-389 except 35-370 and aircraft 36-036 thru 36-047 except aircraft incorporating AMK 80-17 or AAK 81-1:*
  a. TEST Selector Switch — Rotate to L CUR LIM.
  b. TEST Button — Depress. Green current limiter light will illuminate and remain on while button is held. L GEN light will illuminate and right generator voltage may be reduced approximately 2 vdc.
  c. TEST Selector Switch — Rotate to R CUR LIM.
  d. TEST Button — Depress. Green current limiter light will illuminate and remain on while button is held. R GEN light will illuminate and left generator voltage may be reduced approximately 2 vdc.

ENGINE AIRSTARTS (CONT)

- *Aircraft 35-067 thru 35-389 except 35-370 and aircraft 36-018 thru 36-047 incorporating AMK 80-17 or AAK 81-1*:
  a. L CUR LIMITER and R CUR LIMITER Lights — Check extinguished.

- *Aircraft 35-370, 35-390 and subsequent and aircraft 36-048 and subsequent*:
  a. CUR LIM Light — Check extinguished.

ENGINE AIRSTARTS (CONT)

WINDMILLING AIRSTART (FUEL COMPUTER OFF)

CAUTION

- Fuel computer OFF airstarts should only be attempted when fuel computer ON operation is not available.
- **Do not** attempt windmilling airstart with fuel computer OFF unless airspeed is sufficient to maintain a stabilized Turbine Speed (N2) of 15% and Fan Speed (N1) of 10% minimum. Starter assist airstarts **must** be used when stabilized Turbine Speed (N2) is below 15%.

Affected Engine:

1. Ensure that aircraft is within RELIGHT ENVELOPE (below 20,000 feet) as shown in Figure 3-3, this section.
2. FUEL CMPTR Switch — OFF.
3. Thrust Lever — CUTOFF. Wait 10 seconds to allow fuel to drain from engine.
4. Fuel Supply — Check.
   a. Fuel available from wing tank.
   b. FIRE PULL or ENG FIRE PULL T-Handle — Push in.
5. Fuel Panel Switches — As follows:
   a. JET PUMP Switch — Off.
   b. STANDBY PUMP Switch — ON.
   c. CROSSFLOW Valve — CLOSED.
   d. FUS TANK XFER-FILL Switch — OFF.
   e. FUS VALVE (if installed) — CLOSED.
6. START-GEN Switch — OFF.
7. Electrical Load — Reduce.
8. NAC HEAT Switch — OFF.
9. BLEED AIR Switch — OFF.
10. AIR IGN Switch — ON. Check AIR IGN light illuminated.
11. Thrust Lever — IDLE, check FUEL FLOW indication.
12. Turbine Temp (ITT) — Check rise within 10 seconds.

CAUTION

- If light-off has not occurred within 10 seconds after Thrust Lever is placed in IDLE, abort start.
- If engine accelerates above 80% Fan Speed (N1) with Thrust Lever in IDLE, abort start.

ENGINE AIRSTARTS (CONT)

13. Engine Instruments — Normal indications. (Monitor, fuel computer limiting functions are inoperative in fuel computer OFF mode of operation.)
14. AIR IGN Switch — OFF at 45% Turbine Speed (N2). Check AIR IGN light extinguished.
15. START-GEN Switch — GEN.
16. BLEED AIR Switch — ON.
17. NAC HEAT Switch — On as required.

If No Indication of Light-Off Is Obtained in 10 Seconds:

18. Thrust Lever — CUTOFF.
19. AIR IGN Switch — OFF.
20. Repeat WINDMILLING AIRSTART (FUEL COMPUTER OFF) or STARTER-ASSIST AIRSTART (FUEL COMPUTER OFF) procedure.

If Engine Will Not Restart:

21. Perform ENGINE SHUTDOWN IN FLIGHT procedure, Section IV.

OIL PRESSURE LIGHT ILLUMINATED

Illumination of an Oil Pressure light indicates that engine oil pressure is below 25 psi. Several configurations of the oil pressure light exist:

- Single LO OIL PRESS light on the annunciator panel. Illumination of this light indicates oil pressure of either engine is below 25 psi.
- Single OIL PRESS light on the annunciator panel. Illumination of this light indicates oil pressure of either engine is below 25 psi.
- L LO OIL and R LO OIL lights on the glareshield panel. Illumination of one of these lights indicates oil pressure of the associated engine is below 25 psi.

1. OIL PRESS Indicator — Check to determine oil pressure of both engines.

Affected Engine:

2. OIL TEMP Indicator — Check to determine oil temperature.
3. • **Oil pressure is less than 25 psi:**
   If flight conditions permit, a precautionary engine shutdown is advised. Refer to ENGINE SHUTDOWN IN FLIGHT procedure, Section IV.

OIL PRESSURE LIGHT ILLUMINATED (CONT)

- **Oil pressure is between 25 and 38 psi or oil temperature is high:**
  If flight conditions permit, reduce power to maintain oil temperature limits.
- **Oil pressure and oil temperature are normal:**
  Continue to monitor engine operation.

BLEED AIR LIGHT ILLUMINATED

- *Aircraft 35-067 thru 35-081, 35-083 thru 35-086, and 36-018 thru 36-022 except aircraft incorporating AMK 76-7:*

If either the BLEED AIR L or BLEED AIR R light illuminates, either the primary pressure regulator of the respective air modulating valve has failed or an overheat sensor has tripped the light.

1. Corresponding BLEED AIR Switch — OFF.

- *Aircraft 35-082, 35-087 thru 35-106, 35-108 thru 35-112 and 36-023 thru 36-031 and previous aircraft incorporating AMK 76-7:*

If both the BLEED AIR L and BLEED AIR R lights illuminate, the secondary pressure regulator of one of the air modulating valves has failed.

1. R BLEED AIR Switch — OFF.
   - If both lights go out, continue flight in this configuration.
   - If both lights do not go out, proceed to step 2.
2. R BLEED AIR Switch — On, and L BLEED AIR Switch — OFF.
   - If both lights go out, continue flight in this configuration.
   - If both lights do not go out, proceed to step 3.
3. Reduce power alternately on each engine until both lights go out. Continue flight with the appropriate engine at reduced power.

If either the BLEED AIR L or BLEED AIR R light illuminates, an overheat sensor has tripped the light.

1. Corresponding BLEED AIR Switch — OFF.

- *Aircraft 35-107, 35-113 and subsequent, and 36-032 and subsequent:*

If either the BLEED AIR L or BLEED AIR R warning light illuminates, an overheat sensor in the bleed air ducting or the pylon structure has tripped the light.

1. Corresponding BLEED AIR Switch — OFF.

CABIN ALTITUDE WARNING HORN ACTIVATES OR CABIN ALTITUDE EXCEEDS 10000 FEET (EMERGENCY DESCENT)

1. **Oxygen Masks — Don. Select 100% oxygen.**
2. **Thrust Levers — IDLE.**
3. **Autopilot — Disengage.**
4. **SPOILER Switch — EXT.**
5. **LANDING GEAR Switch — DN below MMO or VLE as appropriate for altitude. Keep sideslip angles to a minimum (ball centered) when extending gear.**
6. **Descend at MMO or VLE as appropriate, but *not* below minimum safe altitude.**
7. **PASS OXY Valve — NORM.**
8. **PASS MASK Valve — MAN.**

WARNING

If pressurization loss is due to structural failure, limit speeds and maneuvering loads as much as possible in descent.

NOTE

- Descent from 45,000 feet to 15,000 feet requires approximately 2 minutes 45 seconds.
- Hats and "ear-muff" type headsets must be removed prior to donning crew oxygen masks.
- The HORN SILENCE switch will mute the cabin altitude warning horn for 60 seconds.

9. Pilot and Copilot OXY-MIC Switches — ON.

NOTE

Communication between crew members can be accomplished by using the INPH function of the AUDIO CONTROL PANEL and increasing the MASTER VOL level.

If Time and Conditions Permit:

10. Transponder — Emergency 7700.
11. Notify controlling agency.
12. Check condition of passengers and provide assistance if conditions permit.

NOTE

Communication with passengers can be accomplished by using PASS SPKR function of the AUDIO CONTROL Panel and adjusting the PASS SPKR VOL level.

DOOR LIGHT ILLUMINATED

Illumination of the red DOOR light indicates that one or more of the cabin entry door locking pins may not be fully engaged, or the cabin entry door actuator hook(s) are still engaged. During flight, the door should not be approached if the red DOOR light is illuminated; however, while on the ground, door latch pin engagement may be visually verified. The cabin entry door has 10 latch pins. *On aircraft with a 36-inch cargo door*, the six pins on the upper portion can be viewed through ports in the door upholstery. *On aircraft with a 24-inch executive door*, only one of the six pins on the upper portion can be viewed through a port in the door upholstery. Two pins in the lower portion may be viewed by opening the inspection doors on the step to reveal the pin mechanism. Ensure that white lines on door structure align with white lines on latch pins. Two latch pins located at the upper/lower door interface, are visible through the upholstery gap at the interface and do not have white lines. If all latch pins are fully engaged and door actuator hook(s) are disengaged, the most probable cause of an illuminated DOOR light is a latch pin switch malfunction.

If light was accompanied by evidence of door failure:

WARNING Door failure may be indicated by loud noise, pressurization leak, or rumble emanating from door area. **Do not approach door.**

1. FASTEN SEAT BELT Switch — On.
2. Cabin Altitude — Up to maximum possible.

NOTE

- *Aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031*, increasing cabin altitude to 9,000 feet will reduce differential pressure while avoiding deactivation of the automatic pressurization system.
- *Aircraft 35-107, 35-113 & subsequent and 36-032 & subsequent*, increasing cabin altitude to 9,000 feet will reduce differential pressure while avoiding actuation of the emergency pressurization system. The amber CAB ALT light will illuminate.

3. Airspeed — Reduce.
4. Establish descent.
5. Land as soon as practical.

If light was not accompanied by evidence of door failure:

WARNING **Do not approach door.**

1. FASTEN SEAT BELT Switch — On.
2. Continue flight. The most probable cause is a latch pin switch malfunction.

CABIN/COCKPIT FIRE, SMOKE, OR FUMES

1. **Crew Oxygen Masks — Don. Select 100% oxygen.**
2. **Smoke Goggles — Don, if available.**
3. **Pilot and Copilot OXY-MIC Switches — ON.**

NOTE

It may be necessary to select EMER or EMERGENCY on 6600214 series or Scott ATO mask regulator if the mask does not seal properly.

Whether or not smoke has dissipated, if it cannot be visibly verified that the fire has been extinguished:

4. Cockpit Door/Curtain — Open.
5. Land as soon as possible.
6. **If source is known:**
   a. Extinguish fire using hand held extinguisher or eliminate the source of smoke or fumes.

NOTE

Crew exposure to high levels of Halon fire extinguisher vapors may result in dizziness, impaired coordination and reduced mental alertness.

   b. • *If fire is not extinguished:*
      (1) Land as soon as possible.
      (2) This checklist is complete.
   • *If fire has been extinguished and can be visibly verified:*
      (1) Land as soon as practical. At the crew's discretion, the oxygen system may be returned to normal.
      (2) This checklist is complete.

If smoke or fumes continue:

7. • *Aircraft 35-067 thru 35-112 except 35-107, and aircraft 36-018 thru 36-031*, CABIN AIR Switch — MAX until smoke or fumes are eliminated.
   • *Aircraft 35-107, 35-113 and subsequent and aircraft 36-032 and subsequent*, One or Both BLEED AIR Switches — EMER until smoke or fumes are eliminated. Advancing thrust levers will increase airflow.
8. AUTO-MAN Switch — MAN.
9. UP-DN Manual Control (red) — Up; maximum 13,000 feet.

CABIN/COCKPIT FIRE, SMOKE, OR FUMES (CONT)

If time and conditions permit:

10. Isolate source of smoke or fumes.
    - If Bleed Air System is suspected source: R BLEED AIR Switch — OFF. If smoke is reduced, continue operation with switch OFF. If smoke is not reduced, R BLEED AIR Switch — ON and L BLEED AIR Switch — OFF. If smoke is reduced, continue operation with switch OFF.
    - If smoke or fume source is electrical:
        a. All Non-essential Electrical Equipment — OFF.
        b. Isolate defective systems bus as follows:

NOTE

> The following steps separate the pilot and copilot electrical systems. If the electrical smoke or fume source is positively identified on the pilot side, pull all BUS TIE circuit breakers on the copilot circuit breaker panel and proceed with step (4).

(1) Copilot's Circuit Breaker Panel — Pull the following circuit breakers.

- *On aircraft 35-067 thru 35-201, 35-205 and aircraft 36-018 thru 36-040 except aircraft modified per AMK 78-13:*

TOP ROW

- AC BUS TIE
- R AC BUS
- R AUX AC BUS (if installed)
- 26 VAC BUS

2ND ROW

- MAIN BUS TIE
- R MAIN BUS
- R IGN & ST
- SEC INV

3RD ROW

- ESS BUS TIE
- R ESS BUS
- R STALL WARN
- AUX INV (if installed)

CABIN/COCKPIT FIRE, SMOKE, OR FUMES (CONT)

- *On aircraft 35-202 and subsequent except 35-205, aircraft 36-041 and subsequent, and prior aircraft modified per AMK 78-13:*

TOP ROW
- AC BUS TIE
- R AC BUS
- R AUX AC BUS (if installed)
- 26 VAC BUS

2ND ROW
- MAIN BUS TIE
- R MAIN BUS
- R IGN & START
- SEC INV

3RD ROW
- ESS A BUS TIE
- R ESS A BUS
- R STALL WARN

BOTTOM ROW
- ESS B BUS TIE
- R ESS B BUS
- AUX INV (if installed)
- CABIN PWR BUS (if installed)

NOTE

All electrical power from the copilot's and cabin interior circuit breaker panels is now off. Allow time for smoke or fumes to dissipate.

If electrical smoke or fumes continue:

(2) All BUS TIE Circuit Breakers — Leave pulled, do not reset.
(3) All other Copilot Circuit Breakers — Reset.

NOTE

This procedure reinstates power to the copilot's circuit breaker panel.

(4) Pilot's Circuit Breaker Panel — Pull the following circuit breakers:

- *On aircraft 35-067 thru 35-201, 35-205, and aircraft 36-018 thru 36-040 except aircraft modified per AMK 78-13:*

TOP ROW
- L AC BUS
- L AUX AC BUS (if installed)
- 26 VAC BUS

2ND ROW
- L MAIN BUS
- L IGN & ST
- PRI INV

3RD ROW
- L ESS BUS
- L STALL WARN
- DOOR ACTR
- ENTRY LT

CABIN/COCKPIT FIRE, SMOKE, OR FUMES (CONT)

- *On aircraft 35-202 and subsequent except 35-205, aircraft 36-041 and subsequent, and prior aircraft modified per AMK 78-13:*

TOP ROW
- L AC BUS
- L AUX AC BUS (if installed)
- 26 VAC BUS

2ND ROW
- L MAIN BUS
- L IGN & START
- PRI INV

3RD ROW
- L ESS A BUS
- L STALL WARN
- DOOR ACTR
- ENTRY LT

BOTTOM ROW
- L ESS B BUS

NOTE

All electrical power from the pilot's circuit breaker panel is now off. Allow time for smoke or fumes to dissipate.

If electrical smoke or fumes continue, the malfunctioning system is connected to the Emergency Power Supply(ies). In this event:

(5) EMER BAT or EMER PWR Switch(es) — OFF.

To restore unaffected electrical systems if necessary (determination of defective system):

11. All BUS TIE Circuit Breakers — Leave pulled, do not reset.
12. All Circuit Breakers on panel with power removed — Pull.
13. One (DC) BUS Circuit Breaker — Reset. Then, reset circuit breakers powered by that BUS circuit breaker.

NOTE

- Pause after resetting each circuit breaker to determine defective system.
- Whenever high electrical loads or smoke or fumes occur; pull the last circuit breaker reset.
- Hot-wired circuit breakers (L and R STALL WARN, DOOR ACTR, ENTRY LT, PRI INV and SEC INV circuit breakers) should be reset in sequence with the other circuit breakers on that bus row.

14. Repeat step 13 for each (DC) BUS circuit breaker.
15. R AC BUS or L AC BUS Circuit Breaker (as applicable) — Reset. Then, reset circuit breakers powered by that AC bus circuit breaker. (Refer to notes under step 13 above).
16. EMER BAT or EMER PWR Switch(es) — On, one at a time. If smoke and fumes recur, set switch off.
17. Third Attitude Gyro — *If emergency power has been restored*, cage then uncage to erect gyro.

CONTROL SYSTEM JAM

Perform PITCH AXIS MALFUNCTION or ROLL OR YAW AXIS MALFUNCTION procedure in this section as applicable to attempt to clear difficulty. If problem is not corrected, attempt to overpower jam. If jam can be overpowered, make a normal landing.

NOTE

For landing with a control jam, fly a long straight-in approach and establish final aircraft configuration at a safe altitude, well before landing.

AILERON JAM

NOTE

For landing, a wide runway with minimum turbulence and crosswind is recommended.

1. Rudder — As required to control roll and track.

NOTE

- Yaw damper should be on to minimize roll oscillations.
- For prolonged flight in a sideslip, set CROSSFLOW switch to OPEN and both STANDBY PUMP switches to ON.

2. Final Approach Configuration — Gear - DN, Flaps - 20°.
3. Final Approach Speed — VREF + 10.
4. Maintain power to touchdown and do not flare.

ELEVATOR JAM

1. Primary Pitch Trim — As required for pitch control.
2. Final Approach Configuration — Gear - DN, Flaps - 20°.
3. Final Approach Speed — VREF + 10.

NOTE

Fly a long straight-in approach to minimize pitch changes and establish final aircraft configuration at a safe altitude, well before landing.

4. Maintain power to touchdown and do not flare.

CONTROL SYSTEM JAM (CONT)

RUDDER JAM

NOTE For landing, a wide runway with minimum turbulence and crosswind is recommended.

1. Aileron — As required to control track.
2. Use asymmetric power if required to minimize sideslip.

NOTE For prolonged flight in a sideslip, set CROSSFLOW switch to OPEN and both STANDBY PUMP switches to ON.

3. Final Approach Configuration — Gear - DN, Flaps - 20°.
4. Final Approach Speed — VREF + 10.
5. Maintain power to touchdown and do not flare.
6. After landing, maintain directional control with differential braking.

NOTE If asymmetric power is used, do not retard power until directional control is established.

OVERSPEED WARNING HORN ACTIVATES (OVERSPEED RECOVERY)

If VMO or MMO is inadvertently exceeded:

WARNING Do not extend the spoilers, or operate with the spoilers deployed, at speeds above VMO/MMO due to significant nose-down pitching moment associated with spoiler deployment.

1. **Thrust Levers — IDLE.**
2. **Autopilot — Disengage.**
3. **Identify aircraft pitch and roll attitude.**

NOTE

- In any aircraft, attitude (particularly roll attitude) may be difficult to identify from visual and instrument references in an extreme nose-down condition.
- **Do not** apply elevator force until bank angle is reduced to less than 90°. A pull elevator force when the bank angle is greater than 90° will increase the nose-down attitude.

4. **Level wings.**
5. **Elevator and Pitch Trim — As required to raise the nose.**

WARNING On any speed excursions beyond MMO, the elevator control must be smoothly and steadily applied to prevent encountering excessive aileron activity and airframe buffet. Beyond MMO, a 1.5 g pullup may be sufficient to excite aileron activity and the g level must be limited to that required to maintain lateral control.

If Mach or airspeed is severe or if pitch and/or roll attitude is extreme or unknown:

6. **Landing Gear Switch — Down.**

CAUTION Minor damage to the landing gear doors may be experienced when the gear is lowered at very high speed. Do not retract landing gear for remainder of flight. After landing, a thorough inspection of the landing gear and doors for condition must be made.

NOTE

- Lowering the landing gear at high speed will increase drag and cause a moderate nose-up pitching moment which is easily controllable, but should be anticipated.
- Extending the landing gear has been flight tested to 0.85 MI and 320 KIAS. Analysis of flight test data indicates that this procedure is applicable at higher speeds.

PITCH AXIS MALFUNCTION

A nose-up pitch axis malfunction or nose-up pitch trim system runaway can result in extremely high pitch attitudes, heavy airframe buffet, and require control forces in excess of 75 pounds for recovery.

A nose-down pitch axis malfunction, nose-down pitch trim system runaway, or nose-down overspeed can result in extremely high airspeeds and require control forces in excess of 75 pounds for recovery.

A binding elevator is evidenced by difficulty in moving the control column when making manual pitch changes.

WARNING

- **Do not** extend spoilers during any nose-down pitch upset at any speed due to significant nose-down pitching moment associated with spoiler deployment.
- On any speed excursion beyond MMO, the elevator control must be smoothly and steadily applied to prevent encountering excessive aileron activity and airframe buffet. Beyond MMO, a 1.5 g pull-up may be sufficient to excite aileron activity and the g level must be limited to that required to maintain lateral control.
- The control wheel master switch (MSW) deactivates the pusher and may compound the problem if the malfunction was encountered near stall.

NOTE

Control pressures may be heavy. Copilot assistance is recommended with this procedure.

1. **Control Wheel Master Switch (MSW) — Depress and hold.**

NOTE

- Yaw damper and autopilot will disengage.
- Stabilizer trim actuator (PRI and SEC pitch trim) will be inoperative while the switch is held.
- Pitch torquer (stick nudger/pusher and stick puller) will be inoperative while the switch is held.

2. **Attitude Control — As required to maintain aircraft control.**
   - **If in nose-up attitude, roll into bank or maintain existing bank until the aircraft nose passes through the horizon.**
   - **If in nose-down attitude, level the wings before pulling the nose up.**

PITCH AXIS MALFUNCTION (CONT)

3. **Thrust Levers — As required.**
   - **If in high-speed nose-down attitude, immediately reduce thrust levers to IDLE position.**
   - **If near stall, advance thrust levers as required to accelerate out of stall regime.**
4. **STALL WARNING Switches — OFF.**
5. **PITCH TRIM Switch (pedestal) — OFF.**

NOTE MACH TRIM light may illuminate due to speed change with the PITCH TRIM selector switch OFF.

6. **AUTOPILOT Switch — OFF.**

7. Control Wheel Master Switch (MSW) — Release.
8. Yaw Damper (PRI or SEC) — Engage.

If flight conditions permit, isolate malfunction as follows:

NOTE A trim system malfunction, with the flaps up, will be accompanied by the audio clicker; however, the autopilot and Mach trim systems also run pitch trim.

9. **Pitch Trim System:** PITCH TRIM Switch (pedestal) — Operate to PRI then SEC to isolate malfunctioning trim system.
   - If malfunction recurs in PRI pitch trim:
     a. PITCH TRIM Switch (pedestal) — SEC.
     b. NOSE DN-NOSE UP Switch (pedestal) — Operate to retrim aircraft as required.
     c. PITCH TRIM Circuit Breaker (pilot's ess bus) — Pull.

NOTE Mach trim will be inoperative. If autopilot is not engaged, **Do not exceed MMO (0.74 MI)**.

   - If malfunction recurs in SEC pitch trim:
     a. PITCH TRIM Switch (pedestal) — PRI.
     b. Control Wheel Trim Switch — Operate to retrim aircraft as required.
     c. SEC PITCH TRIM Circuit Breaker (copilot's ess bus) — Pull.

NOTE Autopilot trim will be inoperative. If Mach trim has been disabled also, **Do not exceed MMO (0.74 MI)**.

   - If malfunction does not recur:
     a. PITCH TRIM Switch (pedestal) — PRI or SEC as desired.
     b. Maintain aircraft trim with selected trim system.

NOTE Probable cause of malfunction was autopilot (if autopilot was engaged). **Do not engage autopilot**.

PITCH AXIS MALFUNCTION (CONT)

- If neither PRI nor SEC pitch trim can be restored, refer to JAMMED STABILIZER LANDING, Section IV.

10. **Stall Warning System:** STALL WARNING Switches — ON, one at a time, to isolate malfunctioning system. If malfunction recurs, set appropriate switch OFF.

NOTE

- An abrupt nose-down control column movement is evidence of a stick pusher malfunction.
- Below MMO, a nose-up tendency is evidence of a stick puller malfunction.

- If both STALL WARNING switches are OFF:
  - a. Maintain airspeed at least 30 knots above stall speeds shown in Section V. VREF may be maintained on final approach in the landing configuration.
  - b. Limit bank angles to 30° maximum.
- If L STALL WARNING switch is OFF, stick puller is inoperative — **Do not exceed MMO (0.74 MI)**.
- If malfunction does not recur, probable cause of malfunction was the autopilot (if autopilot was engaged). **Do not engage autopilot.**

11. If malfunction has not been isolated to autopilot:
    - a. AUTOPILOT Switch — On.
    - b. Autopilot — As desired.
12. Yaw Damper (PRI or SEC) — Check engaged.

NOTE

If malfunction was isolated to L STALL, use SEC yaw damper. If malfunction was isolated to R STALL use PRI yaw damper.

ROLL OR YAW AXIS MALFUNCTION

1. **Control Wheel Master Switch (MSW) — Depress. Yaw damper and autopilot will disengage and correct the malfunction if either was the cause.**
2. **Attitude Control — As required to maintain aircraft control.**

If control force continues:

3. **Airspeed — Reduce to minimize force.**
4. **ROLL TRIM or YAW TRIM Circuit Breaker (pilot's ess bus) — Pull affected axis.**

5. • **If malfunction was isolated to yaw damper:**
   a. Select opposite yaw damper.

   • **If malfunction was isolated to autopilot:**
   a. Do not engage autopilot.
   b. Engage yaw damper.

   • **If malfunction was isolated to roll or yaw trim system:**
   a. Use asymmetric thrust and fuel imbalance, as required to minimize mistrim.
   b. Land as soon as practical.

NOTE A normal approach and landing can be made with only light control forces to overcome full roll or yaw trim.

FUEL PRESS LIGHT ILLUMINATED

Illumination of a red FUEL PRESS light is an indication of loss of fuel pressure to the engine. Probable cause is jet pump failure.

Affected Engine:

1. Thrust Lever — Retard.
2. STANDBY PUMP Switch — ON.
3. AIR IGN Switch — On.
4. CROSSFLOW Switch — CLOSE.
5. FUS TANK XFER-FILL Switch — OFF.

NOTE Fuselage fuel transfer deactivates the wing standby pumps. The fuel in the fuselage tank will not be available • above 25,000 feet. Below 25,000 feet the engine-driven fuel pump will suction feed sufficient fuel to supply the engine and fuselage fuel transfer can be accomplished. Replan flight accordingly.

6. FUS VALVE Switch (if installed) — CLOSE.
7. JET PUMP Switch — ON for tip tank fuel transfer.

If FUEL PRESS light does not extinguish:

8. JET PUMP Switch — Off.

If FUEL PRESS light does not extinguish:

9. Descend to 25,000 feet or lower.

NOTE The engine-driven fuel pump will suction feed sufficient fuel to supply the engine at altitudes of 25,000 feet or below.

DITCHING

This aircraft has not been certified for ditching under all the applicable provisions of FAR 25. However, a successful ditching has been conducted in a similar model Learjet. The following procedure will enhance the probability of a successful ditching.

Plan the descent to ensure minimum fuel remaining and improve buoyancy. Ensure sufficient fuel for controlled, power-on approach. This aircraft exhibits good buoyancy properties, floating near level or slightly tail low. After ditching, the airplane may remain afloat for some time if it does not sustain serious damage on landing.

1. If time and conditions permit:
   a. Head toward nearest land or vessel.
   b. Notify controlling agency.
   c. Transponder — Emergency 7700.
   d. ELT Switch (if installed) — ON.
   e. Life vests — On.

NOTE Inform passengers **not** to inflate life vests while inside aircraft.

   f. Brief passengers as required.
      (1) Use of available flotation equipment.
      (2) Location and operation of emergency exits. **Do not** open lower cabin door at any time.
      (3) All loose items — secure.
      (4) Emergency landing brace position.
      (5) Several impacts may be felt, depending on the sea conditions. Do not release seat belts after first impact is felt.
   g. NO SMOKING/FASTEN SEAT BELTS Switch — ON.
   h. Seat belts — On until aircraft comes to a complete stop.
   i. FUEL JTSN Switch — ON (lights on). Set switch Off (lights off) when jettison is complete or prior to touchdown.
2. LANDING GEAR Switch — UP.
3. Flaps — DN.

NOTE The landing gear warning horn will sound with landing gear up and flaps down.

4. CABIN AIR or CAB AIR Switch — OFF.

DITCHING (CONT)

5. EMER BAT or EMER PWR Switch(es) — OFF.
6. Perform normal power-on approach at VREF.

CAUTION Plan landing direction as follows:

   a. Calm Sea — Into wind.
   b. Moderate Swells — Parallel to swells.
   c. High Winds — Into wind, attempting to land on upwind (far) side of swell.

7. Thrust Levers — CUTOFF at touchdown.
8. FIRE PULL or ENG FIRE PULL T-Handles — Pull.
9. Battery Switches — OFF.
10. Emergency Exit(s) — Open after airplane comes to a complete stop. **Do not** open lower cabin door at any time.

EMERGENCY BRAKING

In the event of failure of the normal brake system, emergency brakes can be used to stop the airplane. When using emergency braking, anti-skid protection is not available, and the anti-skid OFF corrections presented in Section V will be applicable.

1. **Pull EMER BRAKE handle out of recess.**
2. **Push downward on handle to apply brake pressure.**

NOTE

- The EMER BRAKE handle must be pushed down approximately 2 inches before braking action begins. To realize the optimum benefit from the emergency braking system, the following technique should be employed:
  a. Apply the brakes smoothly with small movements to produce improved feel and reduce the probability of tire skid. Do not pump the brake handle.
  b. Avoid taxiing if sufficient brake pressure is not available.
- An emergency air bottle charged to the lower end of the green segment (1800 psi) will provide for landing gear extension using the abnormal procedure and approximately 10 brake applications.

3. Rudder and/or nose wheel steering — As required for directional control.

EMERGENCY EVACUATION

1. **Stop the aircraft.**
2. **PARKING BRAKE — Set.**
3. **Thrust Levers — CUTOFF.**
4. • ***If an engine fire is suspected:***
   a. **Applicable FIRE PULL or ENG FIRE PULL T-Handle — Pull.**
   b. **Either ARMED Light — Depress.**
   c. **Other FIRE PULL or ENG FIRE PULL T-Handle — Pull.**

   • ***If engine fire is not suspected:***
   a. **Both FIRE PULL or ENG FIRE PULL T-Handles — Pull.**
5. **Both Battery Switches — OFF.**
6. Evacuate the aircraft:
   a. Cabin Entry Door — Open and exit aircraft. The upper door is openable with the landing gear retracted.
   b. Aft Cabin Emergency Exit — Open and exit using the wing step area.

LANDING — BOTH ENGINES INOPERATIVE

Airplane best glide speed, in the clean configuration, is VREF + 60. The still-air gliding distance is approximately 2 nm per 1000 feet of altitude.

1. If time permits:
   a. Transponder — Emergency 7700.
   b. Advise controlling agency.
   c. Prepare passengers for emergency landing.
   d. NO SMOKING/FASTEN SEAT BELTS Sign — ON.
2. FUEL JTSN Switch — ON (lights on). Set switch Off (lights out) after jettisoning is complete or prior to touchdown.
3. HYD PUMP Switch — On.
4. LANDING GEAR Switch — DN.
5. Flaps — DN.
6. FIRE PULL or ENG FIRE PULL T-Handles — Pull.

NOTE Pulling the FIRE PULL or ENG FIRE PULL T-Handles stops the flow of fuel and hydraulic fluid to the engines, shuts off bleed air from the engines and arms the engine fire extinguisher systems.

7. START-GEN Switches — OFF.
8. Battery Switches — OFF.
9. EMER BAT or EMER PWR Switch(es) — OFF prior to touchdown.
10. Touch down in normal landing attitude.
11. After touchdown, Cabin Door and Emergency Exit — Open.

STALL WARNING ACTIVATES

The stall warning computer has sensed a limit angle of attack. The red STALL lights will flash, the control column stick shaker will activate, the control column nudger will activate, and the angle-of-attack indicators will be in the yellow segment. If the angle of attack continues to increase, the stick pusher will activate.

NOTE If the pusher has activated, or the aircraft is decelerating rapidly below shaker, priority must be given to immediately reducing the angle of attack rather than attempting to maintain altitude. If the aircraft is forced beyond the pusher angle of attack, a deep stall is possible, which may result in insufficient nose-down elevator authority to recover from a stall. In this event, retracting the flaps (if extended) may improve the elevator authority sufficiently to recover.

1. **Lower the pitch attitude to reduce angle of attack.**
2. **Thrust Levers — Set to takeoff power.**
3. **Level the wings.**
4. **Accelerate out of the stall condition.**

ABORTED TAKEOFF

1. **Thrust Levers — IDLE.**
2. **Wheel Brakes — Apply.**
3. **Spoilers — EXT.**
4. Drag Chute or Thrust Reversers (if installed) — Deploy, if necessary.
5. - *If rejected takeoff was made at a speed of less than 40 knots*, one subsequent takeoff attempt may be made without any waiting period.
   - *If rejected takeoff was made at a speed of between 40 and 80 knots*, a 20-minute waiting period must be observed, and the main gear tires, wheels and brakes must be visually inspected before a subsequent takeoff attempt is made.
   - *If rejected takeoff was made at a speed of greater than 80 knots, but with the airplane below the maximum landing brake energy weight (see applicable LANDING WEIGHT LIMITS chart in Section V)*, a 1-hour waiting period must be observed, and the main gear tires, wheels and brakes must be visually inspected before a subsequent takeoff attempt is made.
   - *If a rejected takeoff was made at a speed of greater than 80 knots and with the airplane at or above the maximum landing brake energy weight (see applicable LANDING WEIGHT LIMITS chart in Section V)*, see maintenance personnel to perform the High Energy Stop inspection.

NOTE

- If the stop was conducted above the landing maximum brake energy limit, it is recommended that the PARKING BRAKE be released and chocks used. This will increase the brake cooling efficiency and reduce the possibility of wheel fuse plug release and brake/tire fire.

- Do not attempt a third takeoff after two rejected takeoffs without a 4-hour waiting period and another visual inspection of the main gear tires, wheels, and brakes.

SECTION IV — ABNORMAL PROCEDURES

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INTRODUCTION TO ABNORMAL PROCEDURES

The procedures in this section of the manual have been developed by Learjet Inc. for certification of this aircraft. This section contains those operating procedures requiring the use of special systems and/or alternate use of regular systems which, if followed, will maintain an acceptable level of airworthiness or reduce operational risk resulting from a failure condition.

The procedures located in this section supplement Normal Procedures when a failure condition exists. Use of Normal Procedures should be continued when applicable. Sound judgment, as well as thorough knowledge of the aircraft, its characteristics, and the flight manual procedures are essential in the handling of any failure condition.

OVERRIDING CONSIDERATIONS

In all emergencies, the overriding consideration must be to:

- Maintain Airplane Control
- Analyze the Situation
- Take Proper Action

TERMINOLOGY

Some abnormal procedures require that a landing be made as soon as practical. Refer to emergency procedures (page III-3) for complete definitions of the terms “land as soon as possible” and “land as soon as practical.”

ALC AI LIGHT ILLUMINATED

Illumination of the amber ALC AI light indicates the alcohol level in the windshield/radome alcohol reservoir is low or depleted.

1. WSHLD/RADOME Switch — OFF when alcohol stops flowing.
2. After landing, assure alcohol reservoir is properly replenished.

ENGINE ICE INGESTION

Engine ice ingestion can result in fan damage and abnormal engine operation. Engine ice ingestion can be suspected whenever ice is shed from the wing, fuselage, windshield, or nacelle. This may occur when anti-ice systems are energized after significant ice accumulation has occurred on the above surfaces. Ice ingestion may be evident by a change in engine sound or frequency, audible report, sharp rise in Turbine Temperature (ITT), or RPM hang-up.

Experience to date has shown that, if proper procedures are observed, there is a very high probability of satisfactory engine operation after experiencing foreign object damage from ice in the engine fan. Such damage can reduce the compressor stall margin so that the engine could become more sensitive to rapid thrust lever movements, inlet pressure profile variation due to maneuvering, and high RPM operation. Some compressor stalls will result in engine flameout.

1. AIR IGN Switches — On. Leave On for the duration of the condition.
2. Thrust Lever movements should be slow and cautious.
3. Engine RPM — Set as low as possible to maintain anti-icing heat and cabin pressure.
4. Avoid any abrupt changes in pitch, yaw or roll.
5. To determine extent of engine damage due to ice ingestion, proceed as follows:
   a. Thrust Levers (one at a time) — Retard to flight idle. Then cautiously advance and check for any vibration or abnormal noise on each engine.

NOTE If compressor stall is encountered, retard thrust lever until smooth operation is obtained. (If any of the fan blades have been damaged, the noise level and frequency will increase with an increase of RPM).

ENGINE ICE INGESTION (CONT)

b. If either engine flames out, airstart in accordance with ENGINE AIRSTART procedure, Section III. After restart, repeat step 5, but stay below engine speed at which engine flamed out.

c. If ice damage has been experienced, land as soon as practical and within limitations of operating capacity of engine as defined by this procedure.

NOTE

After landing, inspect engine for damage any time inadvertent icing conditions have been encountered.

ENG ICE LIGHT ILLUMINATED

A failure of the nacelle heat system (bleed air) is indicated by illumination of the amber L or R ENG ICE light. Two types of failures are annunciated with these lights. The first is an uncommanded application of nacelle heat, and the second is a failure of nacelle heat to activate when commanded.

Affected Engine:

1. NAC HT Circuit Breaker (Main Bus) — Pull and/or reset.

If light remains illuminated:

2. - *If associated NAC HEAT switch is OFF,* Engine RPM — Reduce to minimum required.
   - *If associated NAC HEAT switch is On,* Engine RPM — Increase to improve airflow. Fly out of icing conditions if possible.

INADVERTENT ICING ENCOUNTER

- **If icing is inadvertently encountered:**

1. All Anti-Ice Systems — Activate immediately to preclude ice accumulation.

   If approach and landing must be made with any amount of ice on the airframe:

   a. Do not extend flaps beyond 20°.

   b. Use landing procedure for a wing and stabilizer heat failure. Refer to WING AND STAB HEAT FAILURE — LANDING, this section.

WARNING

Even **small** accumulations of ice on the wing leading edge can cause aerodynamic stall prior to activation of the stick shaker and/or pusher. These ice accumulations can cause angle-of-attack indicator information to be unreliable.

NOTE

Ice accumulation on the stabilizer may cause deterioration in trim speeds and changes in handling characteristics. Low speed flight should be approached with care so that detection of abnormal flying qualities can be obtained. It may be necessary to land with flaps at 20° as some buffet and/or some nose pitch may be encountered with the flaps full down.

- **If heavy ice accumulation has occurred, proceed as follows:**

If en route and destination temperatures remain below freezing, consideration should be given to landing with ice on the wings.

- *If landing with ice on the wings and stabilizer:*

1. Use landing procedure for a wing and stabilizer heat failure. Refer to WING AND STAB HEAT FAILURE — LANDING, this section.

- *If attempting to remove ice accumulation:*

1. AIR IGN Switches — On.
2. Engine RPM — Set as low as possible to maintain anti-icing heat and cabin pressure.
3. NAC HEAT Switch (for one engine) — On; wait until satisfactory engine operation is apparent, then opposite engine NAC HEAT Switch — On; observe Turbine Temperature (ITT) rise and ENG ICE light out for operation of engine anti-ice.
4. After satisfactory engine operation is apparent, STAB WING HEAT Switch — On.
5. After satisfactory engine operation is again apparent, energize remaining anti-ice systems, one system at a time, waiting for satisfactory engine operation between energizing each system.

PITOT HEAT LIGHT ILLUMINATED

Illumination of a Pitot Heat light indicates that one or more of the pitot tube heaters are inoperative or one or both PITOT HEAT switches are OFF. Several configurations of the pitot heat monitor exist:

- Single PITOT HEAT light on the instrument panel
- L PITOT HEAT and R PITOT HEAT lights on the instrument panel
- Single PITOT HT light on the annunciator panel

1. PITOT HEAT Switches — Check, On.
2. L and R PITOT HT Circuit Breakers (Ess Bus) — Check, In.
3. Pilot's and Copilot's Air Data Instruments — Cross check.

STABILIZER HEAT FAILURE

With the STAB WING HEAT switch On, a stabilizer heat failure is indicated by the STAB TEMP Indicator remaining in the red (below 35°F [1.7°C]) range.

1. STAB & WING HT Circuit Breaker (copilot's main bus) — Check and reset if necessary.
2. Engine RPM — Adjust as required to maintain STAB TEMP indicator in the green range.
3. If STAB TEMP indicator remains in the red range:
    a. Fly out of icing conditions, if possible.
    b. Do not extend flaps beyond 20°.
4. *On aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031,* if cabin altitude climbs to an unacceptable level, CABIN AIR Switch — MAX. Descend to an acceptable level.

Ice accumulation on the stabilizer may cause deterioration in trim speeds and changes in handling characteristics. Low speed flight should be approached with care so that detection of abnormal flying qualities can be obtained. It may be necessary to land with flaps at 20° as some buffet and/or some nose pitch may be encountered with the flaps full down.

For landing procedure with a stabilizer heat failure, refer to STABILIZER HEAT FAILURE — LANDING, this section.

STAB OV HT LIGHT ILLUMINATED

Illumination of the STAB OV HT light indicates that the horizontal stabilizer structure has reached a temperature of 215°F (102°C).

1. STAB TEMP Indicator — Check.
2. If STAB TEMP indicator is approaching or in the yellow range, a stabilizer overheat condition exists:
    a. Engine RPM — Reduce until STAB TEMP indicator is back in the green range.
    b. *If overheat condition remains:*
        (1) STAB WING HEAT Switch — OFF.
        (2) Fly out of icing conditions.

WARNING

Even **small** accumulations of ice on the wing leading edge can cause aerodynamic stall prior to activation of the stick shaker and/or pusher. These ice accumulations can cause angle-of-attack indicator information to be unreliable.

If approach and landing must be made with any ice (or suspected ice during night operations) on the wing leading edge, refer to WING AND STAB HEAT FAILURE — LANDING, this section.

WING HEAT FAILURE

With the STAB WING HEAT switch On, a failure is indicated by the WING TEMP indicator remaining in the red (below 35°F [1.7°C]) range and/or visual indications of ice accumulation.

WARNING

Even **small** accumulations of ice on the wing leading edge can cause aerodynamic stall prior to activation of the stick shaker and/or pusher. These ice accumulations can cause angle-of-attack indicator information to be unreliable.

1. STAB & WING HT Circuit Breaker (copilot's main bus) — Check and reset if necessary.
2. Engine RPM — Adjust as required to maintain WING TEMP indicator in the green range.
3. If WING TEMP indicator remains in the red range and/or visual indications of ice accumulation remain, fly out of icing conditions.
4. *On aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031,* if cabin altitude climbs to an unacceptable level, CABIN AIR Switch — MAX. Descend to an acceptable level.

If approach and landing must be made with any ice (or suspected ice during night operations) on the wing leading edge, refer to WING HEAT FAILURE — LANDING, this section.

WING OV HT LIGHT ILLUMINATED

Illumination of the WING OV HT light indicates that the wing structure has reached a temperature of 215°F (102°C).

1. WING TEMP Indicator — Check.
2. If WING TEMP indicator is approaching or in the yellow range, a wing overheat condition exists:
   a. Engine RPM — Reduce until WING TEMP indicator is back in the green range.
   b. *If overheat condition remains:*
      (1) STAB WING HEAT Switch — OFF.
      (2) Fly out of icing conditions.

WARNING

Even **small** accumulations of ice on the wing leading edge can cause aerodynamic stall prior to activation of the stick shaker and/or pusher. These ice accumulations can cause angle-of-attack indicator information to be unreliable.

If approach and landing must be made with any ice (or suspected ice during night operations) on the wing leading edge, refer to WING AND STAB HEAT FAILURE — LANDING, this section.

WINDSHIELD HEAT FAILURE

With the windshield heat system activated, a failure is indicated by the formation of ice on the heated portion of the windshield.

1. WSHLD HT Circuit Breaker (pilot's main bus) — Check and reset if necessary.
2. • *Aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031,* WSHLD HEAT AUTO-MAN Switch — AUTO.
   • *Aircraft 35-107, 35-113 & subsequent and 36-032 & subsequent,* WSHLD HT Switch — ON.
3. Engine RPM — Increase as required to improve airflow.
4. *On aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031,* if cabin altitude climbs to an unacceptable level, CABIN AIR Switch — MAX. Descend to an acceptable level.

WINDSHIELD HEAT FAILURE (CONT)

If system fails to anti-ice the windshield:

5. - *Aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031,* WSHLD & RADOME/RADOME Switch — WSHLD & RADOME, if required. This will anti-ice the radome and windshield with alcohol flow for approximately 45 minutes.
   - *Aircraft 35-107, 35-113 & subsequent and 36-032 & subsequent,* WSHLD/RADOME-RAD Switch — WSHLD/RADOME, if required. This will anti-ice the radome and windshield with alcohol flow for approximately 45 minutes.
6. - *Aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031,* WSHLD & RADOME/RADOME Switch — OFF when ALC AI light illuminates or clear of icing conditions.
   - *Aircraft 35-107, 35-113 & subsequent and 36-032 & subsequent,* WSHLD/RADOME-RAD Switch — OFF when ALC AI light illuminates or clear of icing conditions.

WSHLD DEFOG LIGHT ILLUMINATED *(Aircraft 35-671 & subsequent and aircraft 36-064 & subsequent)*

NOTE

Any illumination (including momentary flashes) of the L or R WSHLD DEFOG light, other than upon initial activation, should be considered a malfunction. A momentary flash indicates cycling of the over-temperature protection circuit and is not normal.

Illumination of the amber L or R WSHLD DEFOG light indicates an over-temperature condition, under-temperature condition or loss of AC or DC power. Illumination of the WSHLD DEFOG lights, upon initial activation when the windshield temperature is below 80°F (27°C), does not indicate a malfunction. Determination of an overheat or underheat condition can be made by feeling the indicated windshield near the crew member's head. If an under-temperature condition occurs, deactivation of the system is not required. In the event an overheat condition persists for more than 10 minutes, it is desirable to deactivate the windshield defog system.

To deactivate the affected windshield defog system:

1. L or R WSHLD DEFOG Circuit Breaker (ess B bus) — Pull.
2. Check that affected windshield does not continue to heat.

WSHLD DEFOG LIGHT ILLUMINATED (CONT)

If descending with an inoperative defog system into conditions requiring defogging:

1. WSHLD HT Switch — ON.
2. Cockpit shoulder and ankle outlets — Close.
3. AUX HT Switch — CREW.
4. At FL 350:
   a. COOL-FAN Switch — COOL.
   b. AUTO-MAN Switch — MAN.
   c. COLD-HOT Knob — As required.
5. Leave CAB AIR and WSHLD HT on until shutdown.

WSHLD OV HT LIGHT ILLUMINATED

Illumination of the WSHLD OV HT light indicates the bleed air temperature in the windshield nozzles has exceeded the system limits. Airflow should automatically shut off when the WSHLD OV HT light illuminates.

If airflow did not shut off when WSHLD OV HT light illuminated:

1. • *Aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031:*
   a. WSHLD HEAT AUTO-MAN Switch — MAN.
   b. WSHLD HEAT ON-OFF Switch — Hold to OFF until airflow stops.
   c. **If WSHLD OV HT light remains on,** reduce engine power and/or push in IN NORMAL OUT DEFOG knob to reduce hot airflow to windshield.

   • *Aircraft 35-107, 35-113 & subsequent and 36-032 & subsequent,* WSHLD HT Switch — OFF.

SINGLE GENERATOR FAILURE

1. Electrical Load — Reduce.
   a. COOL-FAN-OFF Switch — OFF.
   b. Shed other loads as required to observe generator limits.
2. IGN & ST Circuit Breaker (main power bus) — Check and reset.
3. START-GEN Switch — GEN.

NOTE START-GEN switch must be set to GEN for GEN RESET switch to be effective.

4. GEN RESET Switch — Depress momentarily.

CAUTION Depressing and holding the GEN RESET switch longer than one-half second, or multiple activations, may cause damage to the electrical system.

If Generator Does Not Reset:

5. Turbine Speed (N2) — 80% or greater.
6. START-GEN Switch — OFF, then GEN.
7. GEN RESET Switch — Depress momentarily.

CAUTION Depressing and holding the GEN RESET switch longer than one-half second, or multiple activations, may cause damage to the electrical system.

If Generator Does Not Reset:

8. START-GEN Switch — OFF.

INVERTER FAILURE — PARTIAL AC POWER LOSS

An inverter system failure is indicated by illumination of the PRI INV, SEC INV, and/or AUX INV (if installed) lights. An INV light will illuminate whenever the associated inverter is on and voltage and/or current flow on the corresponding AC bus falls below a minimum value. The most likely cause is either an inverter failure or open AC BUS circuit breaker. The PRI and SEC INV lights will also illuminate whenever the BATTERY switches are on and the respective INVERTER switch is OFF.

FAILURE OF PRI OR SEC INVERTER SYSTEM

1. INV (main power bus) and AC BUS (ac bus) Circuit Breakers — Check and reset.

NOTE

Allow approximately one minute cooling time before resetting either INV circuit breaker.

2. Failed INVERTER Switch — OFF, then On.
3. Failed INV Circuit Breaker — Pull, then reset.

If malfunction does not clear:

4. Failed INVERTER Switch — OFF.
5. Corresponding AC BUS Circuit Breaker — Pull.
6. AC BUS TIE Circuit Breaker (copilot's panel) — Check and reset. If it opens after resetting, leave it open.

NOTE

If only one inverter is operational, reduce load on both AC buses. Both AC buses will be powered by the operating inverter providing the AC BUS TIE circuit breaker is closed.

7. AUX INVERTER Bus Switch (if installed) — Select failed bus (L or R BUS).

NOTE

Malfunction of the auxiliary inverter system, after being connected to the failed AC bus, indicates a fault on the AC bus.

INVERTER FAILURE — PARTIAL AC POWER LOSS (CONT)

If auxiliary inverter system malfunctions:

a. AUX AC BUS Circuit Breaker (ac bus) associated with failed AC bus — Pull.
b. AUX INVERTER Bus Switch — Select opposite AC bus.
c. AUX INV Circuit Breaker (copilot's ess bus) — Check and reset. Allow approximately one minute cooling time before resetting.

NOTE *On aircraft 35-671 & subsequent and 36-064 & subsequent*, loss of an inverter may cause partial loss of windshield defog capability.

FAILURE OF AUXILIARY INVERTER SYSTEM (If Installed)

1. AUX INVERTER Switch — OFF.
2. L and R AUX AC BUS Circuit Breakers (ac bus) — Pull.

ABNORMAL ENGINE OPERATION

(FAN SPEED [N1] OR TURBINE SPEED [N2] DECREASING OR INAPPROPRIATE FOR THRUST LEVER POSITION)

Affected Engine:

1. Thrust Lever — IDLE.
2. FUEL CMPTR Switch — OFF.
3. If engine characteristics appear normal, continue flight with fuel computer in manual mode. Refer to FUEL CMPTR LIGHT ILLUMINATED procedure, this section.

FUEL CMPTR LIGHT ILLUMINATED

Illumination of an amber FUEL CMPTR light indicates that the corresponding fuel computer has failed or the corresponding FUEL CMPTR switch is OFF. Automatic fuel regulation functions of the affected engine are lost and engine operation reverts to fuel computer off mode. Engine instruments must be monitored to ensure limits are maintained.

Engine thrust may tend to increase or decrease depending on ambient temperature and flight conditions.

NOTE Engine acceleration with fuel computer inoperative is much slower than with fuel computer on.

FUEL CMPTR LIGHT ILLUMINATED (CONT)

Affected Engine:

1. FUEL COMPTR Circuit Breaker (ess bus) — Check and reset if necessary.
2. FUEL CMPTR Switch — Cycle once. If fuel computer does not come back on line, FUEL CMPTR Switch — OFF.

NOTE Fan Speed (N1) must be 50% to 60% when switching from Fuel Computer OFF to Fuel Computer On operation. This procedure prevents RPM droop caused by rapid dropout of the manual mode governor and the lag setup of the computer governor.

3. CROSSFLOW Switch — CLOSE.
4. FUS TANK Switches — As follows:
   a. XFER-FILL Switch — OFF.
   b. FUS VALVE Switch (if installed) — CLOSE.
5. STANDBY PUMP Switch — ON.
6. JET PUMP Switch — Off.

NOTE Use of the standby pump as the primary pump on the engine with the inoperative fuel computer will prevent fuel control pneumatic circuit icing by recirculating fuel within the fuel control.

To crossflow or transfer fuel:

NOTE

- Monitor turbine (N2) and fan (N1) speed during fuel transfer.
- Before switching JET PUMP switch to ON, ensure steady engine operation at 80% N1 or above.

7. JET PUMP Switch (affected engine) — ON.
8. STANDBY PUMP Switch (affected engine) — Off.
9. Crossflow or transfer fuel as required.
10. STANDBY PUMP Switch (affected engine) — ON.
11. JET PUMP Switch (affected engine) — Off.

ENG CHIP LIGHT ILLUMINATED

Illumination of either the LH or RH ENG CHIP light (if installed) indicates the presence of metallic particles in the engine oil.

1. Engine Instruments — Monitor for indication of malfunction.
2. Investigate cause at earliest possible maintenance.

ENGINE OVERSPEED

Affected engine:

1. Thrust Lever — Retard.

CAUTION

Do not set affected engine FUEL CMPTR switch OFF. The fuel computer provides additional overspeed protection which may be beneficial.

2. If engine does not respond to thrust lever movement — shutdown engine. Refer to ENGINE SHUTDOWN IN FLIGHT procedure, this section.

ENGINE SHUTDOWN IN FLIGHT

Affected Engine:

1. ENG SYNC Switch — OFF.
2. Thrust Lever — CUTOFF.

CAUTION

The engine fuel and hydraulic pumps will continue to operate with a windmilling engine. Prolonged operation without fluid available to the pumps may cause damage. Therefore, the FIRE PULL or ENG FIRE PULL T-Handle should not be pulled unless a fuel or hydraulic leak is suspected.

3. Rudder Trim — As required.
4. Yaw Damper — Engage.
5. AIR IGN Switch — OFF.
6. START-GEN Switch — OFF.
7. Electrical Load — Reduce.

CAUTION

During single-engine operation, the COOL-FAN switch should be placed to OFF to prevent overloading the operating generator.

8. BLEED AIR Switch — OFF.
9. CROSSFLOW Switch — OPEN. Monitor fuel balance. Crossflow as required.

NOTE

During single-engine operation, maintain slip indicator ball centered.

10. Refer to ENGINE AIRSTARTS, Section III or SINGLE-ENGINE LANDING, this section.

STARTER ENGAGED LIGHT REMAINS ILLUMINATED AFTER START

(Aircraft 35-067 thru 35-389 except 35-370 and 36-018 thru 36-047 when incorporating AMK 80-17 but not incorporating AAK 81-1)

GROUND START (Fuel Computer ON or OFF)

1. Affected START-GEN Switch — GEN.

   - **If Starter Engaged light remains illuminated**, the starter has not disengaged.

2. Shut down affected engine.
3. Turn off all electrical power.
4. **Do not dispatch** until trouble has been corrected.

STARTER-ASSIST AIRSTART (Fuel computer ON or OFF)

1. Complete airstart procedure.
2. Affected START-GEN Switch — GEN.

   - **If Starter Engaged light goes out**, the starter has disengaged.
     a. Continue flight.
     b. Correct trouble before next flight.

   - **If Starter Engaged light remains illuminated**, the starter has not disengaged.
     a. Affected IGN & ST Circuit Breaker (applicable main bus) — Pull.

NOTE

Opening an IGN & ST circuit breaker will render the corresponding generator inoperative and cause the corresponding GEN light to illuminate.

   - **If Starter Engaged light goes out**, the starter has disengaged.
     (1) Continue flight.
     (2) Refer to SINGLE GENERATOR FAILURE, this section.
     (3) Correct problem before next flight.

   - **If Starter Engaged light remains illuminated**, the starter has not disengaged.
     (1) Affected IGN & ST Circuit Breaker — Reset.
     (2) Land as soon as practical.
     (3) Correct problem before next flight.

STARTER ENGAGED LIGHT REMAINS ILLUMINATED AFTER START

(Aircraft 35-370, 35-390 & subsequent; 36-048 & subsequent and prior aircraft incorporating AAK 81-1)

GROUND START (Fuel Computer ON or OFF)

1. Affected START-GEN Switch — GEN.

   - **If Starter Engaged light remains illuminated**, both contactors have failed and starter is still engaged.
   - **If Starter Engaged light goes out**, one contactor has failed and starter has disengaged. The starter will be energized anytime the START-GEN Switch is in the OFF or START positions.

2. Shut down affected engine.
3. Turn off all electrical power.
4. **Do not dispatch** until trouble has been corrected.

STARTER-ASSIST AIRSTART (Fuel Computer ON or OFF)

1. Complete airstart procedure.
2. Affected START-GEN Switch — GEN.
   - **If Starter Engaged light goes out**, one contactor has failed and starter has disengaged. The starter will be energized anytime the START-GEN Switch is in the OFF or START position.
     a. Continue flight.
     b. Correct trouble before next flight.
   - **If Starter Engaged light remains illuminated**, both contactors have failed and starter is still engaged.
     a. Affected IGN & ST Circuit Breaker (applicable main bus) — Pull.

NOTE Opening an IGN & ST circuit breaker will render the corresponding generator inoperative and cause the corresponding GEN light to illuminate.

   - **If Starter Engaged light goes out**, the starter has disengaged.
     (1) Continue flight.
     (2) Refer to SINGLE GENERATOR FAILURE, this section.
     (3) Correct problem before next flight.
   - **If Starter Engaged light remains illuminated**, the starter has not disengaged.
     (1) Affected IGN & ST Circuit Breaker — Reset.
     (2) Land as soon as practical.
     (3) Correct problem before next flight.

CABIN AUXILIARY HEATER FAILS ON — *Aircraft NOT Incorporating SB 35/36-21-26*

If the cabin auxiliary heater continues to heat with AUX HT Switch in the OFF position, a control relay may have failed in the closed position. Use cabin fan for remainder of flight to prevent the cabin auxiliary heater from overheating.

1. AUX CAB HT Circuit Breaker (pilot's main bus) — Pull.

If cabin auxiliary heater continues to heat:

2. CABIN BLOWER Switch (copilot side panel) — Full speed.

After landing:

3. Cabin Air Damper Control Knob (on blower duct in aft cabin) (if applicable) — Leave in CLOSE position.
4. Do not connect ground power.
5. Obtain maintenance for the auxiliary heater prior to next flight.

FAILURE TO DEPRESSURIZE ON THE GROUND

1. CABIN AIR or CAB AIR Switch — OFF.
2. Both BLEED AIR Switches — OFF.

INADVERTENT ACTIVATION OF EMERGENCY AIRFLOW *(Aircraft 35-107, 35-113 & subsequent and aircraft 36-032 & subsequent)*

1. Retard power to 90% RPM or below if practical.
2. •*On aircraft 35-107, 35-113 thru 35-658 and 36-032 thru 36-063, and aircraft not incorporating AMK 90-3*, reset L.H. MOD VAL circuit breaker (pilot's main bus) or R.H. MOD VAL circuit breaker (copilot's main bus) if tripped.

   •*On aircraft 35-659 and subsequent and 36-064 and subsequent, and aircraft incorporating AMK 90-3*, reset L EMER PRESS circuit breaker (pilot's main bus) or R EMER PRESS circuit breaker (copilot's main bus) if tripped.

NOTE Emergency airflow is activated with the loss of electrical power.

If emergency airflow continues:

3. One BLEED AIR Switch — OFF. If emergency flow stops, continue with BLEED AIR Switch — OFF.

If emergency airflow continues:

4. BLEED AIR Switch — On and other BLEED AIR Switch — OFF.

OVERPRESSURIZATION (Differential pressure exceeds red arc)

1. AUTO MAN Switch — MAN.
2. UP DN Manual Control (red) — UP as required to maintain satisfactory pressurization.

If unable to regulate the overpressurization in manual mode:

3. One BLEED AIR Switch — OFF.
4. Adjust power on opposite engine to control cabin pressurization.

CABIN ALTITUDE EXCEEDS 8500 FEET *(Aircraft 35-067 thru 35-112 except 35-107 and aircraft 36-018 thru 36-031)*

1. Crew Oxygen Masks — Don. Select 100% oxygen.

NOTE

> At 10,000 (±500) feet cabin altitude, control pressure to the outflow valve is trapped. This deactivates the Automatic Mode and stops cabin altitude from rising higher if the failure is in the automatic control system.

2. If aircraft is climbing, stop climbing and level off at (or descend to) the nearest appropriate altitude.
3. Pilot and Copilot OXY-MIC Switches — ON.

NOTE

> Communication between crew members can be accomplished by using the INPH function of the AUDIO CONTROL PANEL and increasing the MASTER VOL level.

4. CABIN AIR Switch — NORM.
5. L and R BLEED AIR Switches — On.
6. Cabin Altitude — Check.
7. • **If cabin altitude continues to climb:**
    a. AUTO-MAN Switch — MAN.
    b. UP-DN Manual Control (red) — As required to maintain satisfactory pressurization.

    If cabin altitude continues to climb:

    c. Engine RPM — Maintain.
    d. IN NORMAL OUT DEFOG Knob — Push in.
    e. WSHLD HEAT Switch — AUTO.
    f. CABIN AIR Switch — OFF.

    • **If cabin altitude stabilizes at a safe altitude:**

    a. Continue flight. Continued use of the oxygen system is at the crew's discretion.

CAB ALT LIGHT ILLUMINATED OR CABIN ALTITUDE EXCEEDS 8500 FEET *(Aircraft 35-107, 35-113 & subsequent and aircraft 36-032 & subsequent)*

1. Crew Oxygen Masks — Don. Select 100% oxygen.

NOTE

Whenever cabin altitude exceeds 8,750 (±250) feet, the amber CAB ALT light illuminates and control pressure to the outflow valve is trapped. This deactivates the Automatic Mode and stops cabin altitude from rising higher if failure is in automatic control system.

2. If aircraft is climbing, stop climbing and level off at (or descend to) the nearest appropriate altitude.
3. Pilot and Copilot OXY-MIC Switches — ON.
4. CAB AIR Switch — ON.
5. L and R BLEED AIR Switches — ON.
6. Cabin Altitude — Check.
7. • **If cabin altitude continues to climb:**
   a. AUTO MAN Switch — MAN.
   b. UP DN Manual Control (red) — UP or DN as required to maintain satisfactory pressurization.

   If cabin altitude continues to climb:

   c. L and R BLEED AIR Switches — EMER.

NOTE

- Windshield and stab/wing bleed air anti-ice are not available with both left and right bleed air systems in the emergency pressurization mode. Nacelle Heat and Windshield/Radome alcohol anti-ice will be available.
- The emergency pressurization valves will automatically reposition to the emergency mode and route full bleed air into the cabin at 9,500 (±250) feet cabin altitude with the BLEED AIR switches in the ON position and the EMER PRESS switches (if applicable) in the NORMAL position.

• **If cabin altitude stabilizes at a safe altitude:**

   a. Continue flight. Continued use of the oxygen system is at the crew's discretion.
   b. If cabin temperature becomes hot from the use of EMER BLEED AIR:
      (1) One BLEED AIR Switch — OFF. Ensure cabin pressure is maintained. It is recommended that the Left BLEED AIR switch be set to OFF first because the RH air distribution system delivers air more evenly to the crew compartment and cabin and is required for internal defog of the windshield.
      (2) If temperature is still too high, reduce power on engine supplying bleed air.

OXYGEN DURATION — MINUTES
Aircraft with ZMR 100 Series Crew Masks
FULLY CHARGED SYSTEM

Final Stabilized Cabin Altitude — 1000 Feet	2 Crew —	2 Crew 2 Pass	2 Crew 4 Pass	2 Crew 6 Pass	2 Crew 8 Pass	2 Crew 9 Pass	2 Crew 11 Pass
40	**251**	**80**	**48**	**35**	**28**	**25**	**22**
35	**182**	**71**	**45**	**33**	**26**	**24**	**20**
30	**135**	**63**	**42**	**32**	**26**	**23**	**20**
25	**105**	**56**	**39**	**30**	**25**	**23**	**20**
20	175 **84**	73 **51**	47 **37**	35 **29**	29 **25**	26 **23**	23 **20**
15	124 **67**	63 **45**	44 **34**	34 **28**	28 **24**	26 **23**	23 **20**
10	91 **54**	**PASSENGER OXYGEN NOT REQUIRED**					
8	82 **50**						
7	78 **48**						

- **Bold** face numbers (**xxx**) indicate 100% oxygen (100% OXY position on regulator).
- Light face numbers (xxx) indicate Diluter Demand (NORMAL position on regulator).
- Crew and passenger oxygen masks are not approved for use above 40,000 feet cabin altitude. **Passenger durations above 30,000 feet cabin altitude are provided for information only. Passenger masks will not provide sufficient oxygen for prolonged operation above 34,000 feet cabin altitude. Prolonged operation above 25,000 feet cabin altitude with passengers on board is not recommended.**
- Prior to overwater flights, plan oxygen requirements to provide sufficient oxygen for all occupants in the event of a pressurization failure. Additional oxygen may be required to assure that both oxygen duration and range (fuel) requirements are satisfied.
- For cabin altitudes of 10,000 feet and above, the oxygen duration times include cabin altitude ascent time from 8000 feet to final stabilized cabin altitude.
- To calculate oxygen duration for a less than fully charged system the following formula may be used:

Duration = Duration from chart x (system pressure ÷ 1850)

Figure 4-1

OXYGEN DURATION — MINUTES
Aircraft with 6600214 Series Crew Masks
FULLY CHARGED SYSTEM

Final Stabilized Cabin Altitude — 1000 Feet	2 Crew —	2 Crew 2 Pass	2 Crew 4 Pass	2 Crew 6 Pass	2 Crew 8 Pass	2 Crew 9 Pass	2 Crew 11 Pass
40	267 **251**	84 **79**	51 **47**	36 **34**	29 **27**	26 **24**	22 **21**
35	195 **182**	76 **71**	48 **45**	35 **33**	28 **26**	26 **24**	22 **21**
30	219 **135**	79 **64**	49 **42**	36 **32**	29 **26**	26 **23**	22 **20**
25	252 **105**	83 **56**	50 **39**	37 **30**	29 **25**	26 **23**	22 **20**
20	228 **84**	81 **50**	51 **37**	37 **29**	30 **25**	27 **23**	24 **20**
15	192 **67**	77 **45**	50 **34**	37 **28**	31 **24**	28 **23**	24 **20**
10	163 **54**	**PASSENGER OXYGEN NOT REQUIRED**					
8	153 **50**						
7	148 **48**						

- **Bold** face numbers (**xxx**) indicate 100% oxygen.
- Light face numbers (xxx) indicate Diluter Demand.
- Crew and passenger oxygen masks are not approved for use above 40,000 feet cabin altitude. **Passenger durations above 30,000 feet cabin altitude are provided for information only. Passenger masks will not provide sufficient oxygen for prolonged operation above 34,000 feet cabin altitude. Prolonged operation above 25,000 feet cabin altitude with passengers on board is not recommended.**
- Prior to overwater flights, plan oxygen requirements to provide sufficient oxygen for all occupants in the event of a pressurization failure. Additional oxygen may be required to assure that both oxygen duration and range (fuel) requirements are satisfied.
- For cabin altitudes of 10,000 feet and above, the oxygen duration times include cabin altitude ascent time from 8000 feet to final stabilized cabin altitude.
- To calculate oxygen duration for a less than fully charged system the following formula may be used:

Duration = Duration from chart x (system pressure ÷ 1850)

Figure 4-2

OXYGEN DURATION — MINUTES

Aircraft with Scott ATO Crew Masks

FULLY CHARGED SYSTEM

Final Stabilized Cabin Altitude — 1000 Feet	2 Crew —	2 Crew 2 Pass	2 Crew 4 Pass	2 Crew 6 Pass	2 Crew 8 Pass	2 Crew 9 Pass	2 Crew 11 Pass
40	261 **251**	82 **79**	50 **48**	36 **35**	28 **27**	26 **25**	22 **21**
35	192 **182**	75 **71**	47 **45**	35 **33**	28 **26**	25 **24**	22 **20**
30	145 **135**	68 **64**	45 **42**	34 **32**	27 **26**	25 **24**	22 **20**
25	153 **105**	70 **56**	46 **39**	34 **30**	28 **25**	25 **24**	22 **20**
20	203 **84**	78 **50**	49 **36**	37 **29**	29 **24**	27 **23**	23 **20**
15	261 **67**	86 **45**	53 **34**	39 **28**	32 **24**	29 **23**	25 **20**
10	253 **54**	**PASSENGER OXYGEN NOT REQUIRED**					
8	153 **50**						
7	148 **48**						

- **Bold** face numbers (**xxx**) indicate 100% oxygen.
- Light face numbers (xxx) indicate Diluter Demand.
- Crew and passenger oxygen masks are not approved for use above 40,000 feet cabin altitude. **Passenger durations above 30,000 feet cabin altitude are provided for information only. Passenger masks will not provide sufficient oxygen for prolonged operation above 34,000 feet cabin altitude. Prolonged operation above 25,000 feet cabin altitude with passengers on board is not recommended.**
- Prior to overwater flights, plan oxygen requirements to provide sufficient oxygen for all occupants in the event of a pressurization failure. Additional oxygen may be required to assure that both oxygen duration and range (fuel) requirements are satisfied.
- For cabin altitudes of 10,000 feet and above, the oxygen duration times include cabin altitude ascent time from 8000 feet to final stabilized cabin altitude.
- To calculate oxygen duration for a less than fully charged system the following formula may be used:

Duration = Duration from chart x (system pressure ÷ 1850)

Figure 4-3

TO RETURN TO AUTOMATIC PRESSURIZATION MODE *(Aircraft 35-067 thru 35-112 except 35-107 and aircraft 36-018 thru 36-031)*

If cabin pressurization control is regained in the manual mode, and it is desired to return to automatic mode of operation, proceed as follows:

NOTE

> Whenever cabin altitude increases to 10,000 (±500) feet or above, the automatic mode is deactivated until the cabin altitude is decreased to 7500 feet or below.

1. CABIN ALT Controller — Set at or below 7500 feet.
2. RATE Knob — Turn to full INCR.
3. UP DN Manual Control (red) — Control to altitude selected on CABIN ALT Controller.
4. CABIN CLIMB Indicator — Stabilize at Zero.
5. RATE Knob — Reset to nominal position.
6. AUTO MAN Switch — AUTO.
7. CABIN ALT Controller — Reset (if required) to appropriate cabin altitude for flight altitude.

TO RETURN TO NORMAL PRESSURIZATION AIRFLOW *(Aircraft 35-107, 35-113 & subsequent and aircraft 36-032 & subsequent)*

NOTE

> If cabin altitude exceeds 8750 (±250) feet, the Automatic Pressurization mode is deactivated and the amber CAB ALT light will illuminate. Automatic mode operation will not be available until the cabin altitude is decreased to extinguish the CAB ALT light.

If normal operation is assured and the CAB ALT light is out, the following procedure accomplishes resetting emergency pressurization valves and reactivation of automatic pressurization mode.

1. CAB AIR Switch — ON.
2. AUTO MAN Switch — MAN.
3. UP DN Manual Control (red) — UP or DN as required to maintain cabin altitude below 7,200 feet.
4. One BLEED AIR Switch — OFF then ON.
5. Other BLEED AIR Switch — OFF then ON.
6. UP DN Manual Control (red) — UP or DN as required to maintain cabin altitude appropriate for flight altitude.

Return To Automatic Mode if Desired

7. CABIN CONTROLLER — Set appropriate cabin altitude for flight altitude (at or below 7,200 feet).
8. UP DN Manual Control (red) — UP or DN as required to obtain cabin altitude selected on CABIN CONTROLLER.
9. AUTO MAN Switch — AUTO.

AUG AIL LIGHT ILLUMINATED

If the aileron augmentation system malfunctions, the AUG AIL light will illuminate and the spoilers will retract. Actuating the SPOILERON RESET switch will restore normal operation if the system malfunction clears.

NOTE Landing on a wide runway of sufficient length with minimum turbulence and crosswind is recommended.

1. SPOILER Switch — RET.

WARNING Resetting the spoileron computer should only be done in wings-level stabilized flight conditions above 1,000 feet AGL. Any aileron input while resetting the computer may result in a momentary rapid roll input.

2. SPOILERON RESET Switch — Hold momentarily to RESET.
3. If AUG AIL light illuminates again, pull the SPOILERON circuit breaker (copilot's ac bus).

WARNING Do not reset the SPOILERON circuit breaker after it has been pulled. The monitor may be affected.

   a. Spoilers are inoperative in flight.
   b. Spoilerons are inoperative in flight.
   c. Spoilers will function normally during ground operations.

MACH TRIM MALFUNCTION

A Mach trim malfunction will be indicated by illumination of the red MACH TRIM warning light and, if above 0.74 MI with autopilot not engaged, the overspeed warning horn will sound:

1. Airspeed — Below 0.74 MI.
2. Check that Primary Pitch Trim is available:
    a. PITCH TRIM Switch — PRI.
    b. Primary PITCH Trim Circuit Breaker (pilot's ess bus) — Closed.
3. MACH TRIM Circuit Breaker (pilot's ac bus) — Check:

    •If the MACH TRIM circuit breaker is open:
    a. Reset the MACH TRIM circuit breaker.
    b. TEST Selector Switch — Rotate to MACH TRIM.
    c. TEST Button (center of TEST selector switch) — Press, then release to resynchronize the system.
    d. If the MACH TRIM circuit breaker opens again, leave it open.

    •If the MACH TRIM circuit breaker is closed, the Mach Trim Monitor has deactivated the system.
    a. If it is desired to reset the Mach Trim Monitor:
        (1) TEST Selector Switch — Rotate to MACH TRIM.
        (2) TEST Button (center of TEST selector switch) — Press, then release to resynchronize the system.
    b. If the MACH TRIM warning light continues to illuminate, MACH TRIM Circuit Breaker — Pull.

NOTE With the Mach trim system inoperative, flight above 0.74 MI is permitted when the autopilot is engaged.

PITCH TRIM LIGHT ILLUMINATES IN FLIGHT

Illumination of the amber PITCH TRIM light in flight indicates the trim speed monitor has detected a trim speed fault allowing high trim rates with the flaps up or that the trim monitor has detected a fault that would allow a trim runaway if an additional fault were to occur.

NOTE The PITCH TRIM light will illuminate whenever either control wheel master switch (MSW) is depressed.

1. PITCH TRIM Switch (pedestal) — SEC.
2. NOSE DN-OFF-NOSE UP Switch (pedestal) — Operate as required to maintain trim.

STALL WARNING SYSTEM FAILURE

SINGLE SYSTEM FAILURE

If either stall warning system fails, the associated angle-of-attack indicator will be inoperative or unreliable. Additionally, if the left stall warning system should fail, primary yaw damper authority will not be reduced during approach to a stall. If the right stall warning system should fail, secondary yaw damper authority will not be reduced during approach to a stall.

1. • If L STALL WARNING fails:
   a. L STALL WARNING Switch — OFF.
   b. Select SEC yaw damper.
   c. **Do not exceed MMO (0.74 MI)** (stick puller is inoperative).

   • If R STALL WARNING fails:
   a. R STALL WARNING Switch — OFF.
   b. Select PRI yaw damper.

DUAL SYSTEM FAILURE

If both left and right stall warning systems fail, the stick pusher, stick nudger, and stick shaker will be inoperative and both angle-of-attack indicators will be inoperative or unreliable. With both stall warning systems in a failed condition, stalls can be avoided by reference to the airspeed indicator.

1. L and R STALL WARNING Switches — OFF.
2. **Do not exceed MMO (0.74 MI)** (stick puller is inoperative).
3. Maintain airspeed at least 30 knots above stall speeds shown in section V. VREF may be maintained on final approach in the landing configuration.
4. Limit bank angles to 30° maximum.

YAW DAMPER FAILURE

SINGLE YAW DAMPER FAILURE

1. Engage remaining yaw damper.
2. Avoid flight into areas of moderate/severe turbulence.
3. **Do not** initiate further flight until trouble has been located and corrected.

DUAL YAW DAMPER FAILURE

NOTE

- Maintaining higher airspeed (250 KIAS or higher where applicable) will improve Dutch roll stability.
- Landing with minimum tip fuel will improve Dutch roll stability and lateral control. With both yaw dampers inoperative, plan flight so as to land with both tip tanks empty.

1. Avoid flight into areas of moderate/severe turbulence.
2. Land as soon as practical.
3. **Do not** initiate further flight until trouble has been located and corrected.

CROSSFLOW VALVE FAILS TO OPEN

1. Maintain wing fuel balance by adjusting power setting.
2. - *On aircraft without FUS VALVE switch,* transferring fuselage fuel will result in a right wing heavy condition.
   - *On aircraft with FUS VALVE switch,* transfer fuselage fuel using the following procedure:
     a. FUS TANK XFER-FILL Switch — XFER. Fuel will gravity flow into the left wing tank.
     b. FUS VALVE Switch — OPEN. Fuel will gravity flow into the right wing tank.
     c. Monitor individual wing fuel indications to ensure fuel balance.
     d. - If right wing becomes heavy during fuel transfer:
          (1) FUS VALVE Switch — CLOSE.
          (2) When wing tanks are balanced, FUS VALVE Switch — OPEN.
        - If left wing becomes heavy during fuel transfer:
          (1) FUS TANK XFER-FILL Switch — OFF.
          (2) When wing tanks are balanced, FUS TANK XFER-FILL Switch — XFER.

FUEL FILTER LIGHT ILLUMINATED

On aircraft with replaceable paper fuel filter elements: This is an indication that a filter element is clogging. Fuel filter elements should be replaced prior to the next flight.

On aircraft with cleanable metal fuel filter elements: This is an indication that a primary filter element is clogged and is being bypassed; however, the secondary element is still filtering fuel. The fuel filter elements should be cleaned prior to the next flight.

1. STANDBY PUMP Switches — ON, when possible.

FUEL IMBALANCE DURING FUEL TRANSFER

1. FUS TANK XFR-FILL Switch — OFF.
2. FUS VALVE Switch (if installed) — CLOSE.
3. STANDBY PUMP Switch (heavy wing) — ON.
4. STANDBY PUMP Switch (light wing) — Off.
5. CROSSFLOW Switch — OPEN.
6. Monitor fuel balance.
7. • *If fuel load balances:*
    a. CROSSFLOW Switch — CLOSE.
    b. Both STANDBY PUMP Switches — Off.
    c. Monitor fuel balance when transferring fuselage fuel.

   • *If fuel load does **not** balance:*
    a. STBY PMP Circuit Breaker (light wing) (ess bus) — Pull.
    b. STANDBY PUMP Switch (heavy wing) — Check, On.
    c. CROSSFLOW Switch — Check, OPEN.
    d. Monitor fuel balance.
    e. • *If fuel load balances:*
        (1) CROSSFLOW Switch — CLOSE.
        (2) Both STANDBY PUMP Switches — Off.

NOTE

The problem is a system failure allowing the standby pump to run whenever the circuit breaker is in. In this event, the following conditions will exist:

- Fuselage fuel transfer may be used while the affected STBY PMP circuit breaker is pulled.
- STBY PMP circuit breaker must be reset for conditions requiring the use of the standby pump (i.e., airstarts and loss of fuel pressure).
- STBY PMP circuit breaker must be reset to transfer fuel from the affected wing (crossflow).

• *If fuel load still does **not** balance:*
(1) CROSSFLOW Switch — CLOSE.
(2) Both STANDBY PUMP Switches — Off.

NOTE

- Fuel cannot be transferred to the affected wing and fuselage fuel transfer will aggravate the fuel imbalance. Plan flight accordingly.
- Unequal power settings may be used to balance fuel load.

FUEL JETTISON

Fuel jettisoning is applicable to the tip tanks only and can be accomplished with any combination of flaps, landing gear and speeds. Fuel jettisoning will be faster and the most fuel will be jettisoned while the aircraft is in a nose-up attitude. Time to jettison fuel from tip tanks is approximately 5 minutes.

NOTE If it is desired to jettison fuel from one tip tank only, pull the opposite FUEL JTSN circuit breaker (ess bus) prior to setting FUEL JTSN Switch — ON.

1. FUEL JTSN Switch — ON (both lights on).
2. L and R FUEL JTSN Lights — Check both ON. If only one light illuminates, it indicates that only one valve has opened. FUEL JTSN Switch — Off.
3. Observe aft edge of tip tanks and fuel quantity indicator after actuating the FUEL JTSN switch. Assure that fuel is flowing from both tanks. Monitoring fuel quantity indicator is useful at night or other times when visibility is reduced.
4. FUEL JTSN Switch — Off. When jettison is complete, check both FUEL JTSN Lights — Out.

NOTE Jettisoned fuel is not recorded on the fuel counter. Therefore, the fuel counter reading should not be used to compute fuel remaining or aircraft weight after jettisoning fuel.

FUEL TRANSFER VALVE FAILS TO CLOSE

If the left transfer valve (XFER-FILL valve) fails to close after completion of fuel transfer, the crossflow valve will also remain open. In this event, operation of either standby pump will transfer some fuel back into the fuselage tank. Additionally, fuel may gravity flow from both wings into the fuselage tank.

If the right transfer valve (FUS VALVE) (if installed) fails to close after completion of fuel transfer, the crossflow valve will close normally. In this event, operation of the right standby pump will transfer fuel from the right wing into the fuselage tank. Additionally, fuel may gravity flow from the right wing into the fuselage tank.

1. Fuel crossflow operations should be conducted with caution as standby pump operation will transfer fuel back into the fuselage.
2. Periodically transfer fuel back into wings.

NOTE

Since continuous operation of a standby pump may not be possible, a descent to 25,000 feet or below will be required if a jet pump should fail.

FUEL VALVE LIGHTS

Steady illumination of any of the amber fuel valve lights (except FUEL JTSN lights) on the fuel control panel indicates the corresponding valve is not in the position selected. Momentary illumination while the corresponding valve is in transit after switching modes indicates proper operation.

LOW FUEL LIGHT ILLUMINATED

The LOW FUEL light on the glareshield annunciator panel will illuminate when the fuel level in either wing tank is approximately 400-500 pounds (181-227 kilograms) and the aircraft is in level flight.

1. Fuel Quantities — Check. Correct fuel distribution, if required:
    a. Balance wing fuel. Refer to FUEL CROSSFLOW (WING-TO-WING FUEL TRANSFER) procedure in Section II.
    b. Transfer fuselage fuel to the wings. Refer to NORMAL FUSELAGE FUEL TRANSFER procedure in Section II.
2. Replan flight if necessary.

NORMAL FUEL TRANSFER SYSTEM FAILURE — Aircraft with FUS VALVE Switch.

CAUTION

If the aircraft was loaded with additional fuselage fuel in excess of the Maximum Zero Wing and Tip Fuel Weight (13,500 pounds), this additional fuel must be transferred prior to reaching a total wing fuel quantity of 2250 pounds. If unable to transfer this additional fuel, **do not exceed 325 KIAS**.

1. FUS VALVE Switch — OPEN.

NOTE

Approximately 162 pounds of fuselage fuel will be unusable using this fuel transfer method.

2. FUS VALVE Switch — CLOSE, when gravity transfer is complete, or prior to approach.

NORMAL FUEL TRANSFER SYSTEM FAILURE — Aircraft without FUS VALVE Switch.

CAUTION

If the aircraft was loaded with additional fuselage fuel in excess of the Maximum Zero Wing and Tip Fuel Weight (13,500 pounds), this additional fuel must be transferred prior to reaching a total wing fuel quantity of 2250 pounds. If unable to transfer this additional fuel, **do not exceed 325 KIAS**.

TRANSFER VALVE LIGHT REMAINS ILLUMINATED

Steady illumination of the transfer valve light after transfer is selected indicates failure of the transfer valve to open. Fuselage fuel will be unusable.

1. XFER-FILL Switch — OFF.
2. Replan flight accordingly.

IF TRANSFER VALVE LIGHT IS EXTINGUISHED AND TRANSFER IS SLOW AND/OR EMPTY LIGHT IS ILLUMINATED

The transfer valve has opened and the most probable cause of system malfunction is fuselage pump failure. Fuel will gravity flow at a reduced rate. Approximately 162 pounds of fuselage fuel will be unusable.

1. Fuselage Pump Circuit Breaker (copilot's main bus) — Pull.
2. XFER-FILL Switch — Leave in XFER.
3. XFER-FILL Switch — OFF, when gravity transfer is complete, or prior to approach.

STANDBY PUMP FAILS TO SHUT OFF *(Aircraft incorporating SB 35/36-28-11)*

Operation of the electric standby fuel pumps is indicated by illumination of the annunciator light in the corresponding STANDBY PUMP switch. The pumps are turned on manually with the corresponding STANDBY PUMP switch and automatically during starter-assisted engine starts and during fuselage tank FILL.

If standby pump annunciator light does not extinguish when pump is selected off:

1. Corresponding STANDBY PUMP Switch — Cycle.

If standby pump annunciator light does not extinguish:

2. Corresponding STBY PMP Circuit Breaker (ess bus) — Pull.

TIP TANK FAILS TO TRANSFER FUEL

Should a tip tank jet pump fail, fuel will gravity flow to approximately one-half tip tank.

Replan for landing with one tip tank one-half full or jettison fuel remaining in the affected tip tank to maintain balance and execute normal landing.

NOTE

Maximum demonstrated fuel imbalance for landing was approximately 600 pounds (one tip tank half full and the other tip tank empty). However, for best lateral control it is recommended that the tip fuel be jettisoned to balance. This is particularly important if landing is to be made in strong gusty crosswinds or with spoilerons inoperative.

- **If it is decided to jettison fuel:**
  1. Follow FUEL JETTISON procedure, this section.
  2. Ensure that FUEL JTSN switch is Off prior to landing.
  3. Execute normal landing.
- **If it is decided not to jettison fuel:**
  1. Final Approach Configuration — Gear – DN, Flaps – 40° DN.
  2. Final Approach Speed — VREF + 10.
  3. Landing Distance — Multiply by 1.10.

HYDRAULIC SYSTEM FAILURE/ALTERNATE GEAR EXTENSION

Either engine-driven hydraulic pump will supply sufficient pressure to operate all hydraulic systems.

Hydraulic system failure is indicated by a loss of hydraulic pressure. Landing gear, flap, spoiler, and wheel brake systems will be affected. If engine-driven hydraulic pressure is not regained, spoilers will not be available. If neither engine-driven nor auxiliary hydraulic pressure is regained, emergency brakes will be required after landing.

1. SPOILER Switch — RET.

On approach:

2. Airspeed VLO or less (VREF + 30 recommended).
3. LANDING GEAR Switch — DN.
4. GEAR Circuit Breaker (copilot's ess bus) — Pull.
5. SPOILERON Circuit Breaker (copilot's ac bus) — Pull.
6. FLAP Switch — DN.
7. Extend Landing Gear as follows:
   a. EMER GEAR Lever (right side of pedestal) — Push **full down** to latched position.
   b. Check, three green LOCKED DN and two red (main gear) UNSAFE lights illuminated.

CAUTION

Do not attempt to retract landing gear once emergency gear extension has been selected. To do so may cause excessive air pressure to be introduced into the hydraulic return lines, thereby rupturing the reservoir.

NOTE

The two red UNSAFE lights will remain illuminated after emergency gear extension because the inboard gear doors remain open.

   c. After gear is down and locked, EMER GEAR Lever — Return to the full up (latched) position. This is accomplished by lifting the ratchet release (small metal tab accessible through hole forward of emergency gear extension handle) and then pulling the lever to the full up (latched) position.

WARNING

The EMER GEAR lever must be returned to the up position or air pressure for emergency braking will not be available in the event there is a leak in the air line.

   d. • *If all of the three green LOCKED DN light are illuminated,* refer to Refer to HYDRAULIC SYSTEM FAILURE LANDING procedure, this section.
      • *If any gear is not down and locked,* refer to GEAR UP LANDING procedure, this section.

LO HYD (pressure) LIGHT ILLUMINATED (If Installed)

The Low Hydraulic Pressure light illuminates to indicate loss of hydraulic system pressure.

Either engine-driven hydraulic pump will supply sufficient pressure to operate all hydraulic systems. However, the low hydraulic pressure light may illuminate during single hydraulic pump operation.

If hydraulic pressure is not regained, landing gear, flaps, spoilers, and brakes may be affected. Landing distance with no flaps, no spoilers and no anti-skid will be greatly increased.

1. HYDRAULIC PRESSURE — Check.
2. - *If pressure is normal,* continue to monitor.
   - *If pressure is low,* refer to HYDRAULIC SYSTEM FAILURE/ ALTERNATE GEAR EXTENSION procedure and HYDRAULIC SYSTEM FAILURE LANDING procedure, this section.

PITOT-STATIC SYSTEM MALFUNCTION

Static pressure for the pilot's instruments is supplied by a static port on each (L and R) pitot-static probe. Static pressure for the copilot's instruments is supplied by another static port on each of the pitot-static probes. Either or both pitot-static probes can be selected to supply static pressure to the pilot's and copilot's instruments through the STATIC SOURCE switch. Normally the switch is in the BOTH position.

If pitot-static source malfunction is known or suspected:

1. Maintain aircraft control with safe attitude and thrust setting.
2. Compare pilot's and copilot's pitot-static data. A pitot pressure malfunction will affect airspeed and Mach indications. A static pressure malfunction will affect airspeed, Mach, altitude, and vertical speed indications.
3. Pitot Heat:
    a. PITOT HEAT Switches — Check, On.
    b. L & R PITOT HT Circuit Breakers (ess bus) — Check, In.
4. Determine malfunctioning system:
    a. Cross-check angle-of-attack indicators.
    b. Compare indications with estimated performance for existing conditions (attitude, thrust setting, weight, temperature, and altitude).
    c. Compare data from other available sources.

NOTE

The overspeed warning horn and stick puller will actuate if either the pilot's or copilot's airspeed indicator needle is above the VMO/MMO "barber pole" pointer.

Speed data may be obtained from the following:

- FMS and SAT/TAS systems (if installed) provide a source for true airspeed from the pilot's pitot-static system.
- DME systems and ground based radar provide a source for ground speed. By applying the winds to the ground speed, the aircraft's airspeed may be calculated.
- Pitot-static data to the autopilot/flight director is provided by the copilot's pitot-static system.

PITOT-STATIC SYSTEM MALFUNCTION (CONT)

If static pressure malfunction is determined or suspected:

5. Autopilot — Disengage.
6. STATIC SOURCE Switch — L or R as applicable.
7. Autopilot — As desired.

NOTE Selecting L or R static source does not affect airspeed calibrations or altitude position corrections as presented in Section V.

VERTICAL GYRO MONITOR LIGHT ILLUMINATED

On aircraft with J.E.T. VG-206 vertical gyros, illumination of an amber L or R V.G. MON light indicates one wheel of the affected gyro has failed. The remaining wheel is still operative and the gyro is still reliable. However, the gyro should be replaced as soon as practical.

ALTERNATE GEAR EXTENSION/ELECTRICAL MALFUNCTION

1. Airspeed — VLO or less.
2. LANDING GEAR Switch — DN.
3. GEAR Circuit Breaker (copilot's ess bus) — Pull.
4. Extend landing gear as follows:
   a. EMER GEAR Lever (right side of pedestal) — Push **full down** to latched position.
   b. Check, three green LOCKED DN and two red outboard UNSAFE lights illuminated.

CAUTION **Do not** attempt to retract landing gear once emergency gear extension has been selected. To do so may cause excessive air pressure to be introduced into the hydraulic return lines, thereby rupturing the reservoir.

NOTE The two red UNSAFE lights will remain illuminated after emergency gear extension because the inboard gear doors remain open.

   c. *If any gear is not down and locked,* refer to GEAR UP LANDING procedure, this section.

ANTI-SKID GEN LIGHT ILLUMINATED — ANTI-SKID OFF OPERATION

Illumination of any ANTI-SKID GEN light indicates an anti-skid problem with the associated wheel. If ANTI-SKID switch is OFF, all four ANTI-SKID GEN lights will illuminate. When anti-skid (for any wheel) is inoperative, care must be used during brake application and stopping distances will be increased. Refer to Section V for increased stopping distances for takeoff and landing.

1. ANTI-SKID Switch — OFF, then On. This should clear the system.

If any ANTI-SKID GEN light(s) remain illuminated:

- a. ANTI-SKID Switch — OFF. Refer to Section V for increased stopping distances for takeoff and landing.
- b. Cautiously apply brakes as required.

CAUTION

With anti-skid inoperative, heavy brake pressures may skid the tires and cause tire blow-out. During flight tests, it was determined that modulating toe-brake pressures will produce improved feel and reduce the probability of tire skid.

- c. Be prepared to use EMERGENCY BRAKING procedure, Section III, if necessary.

NOSE WHEEL STEERING MALFUNCTION

A nose wheel steering malfunction is indicated by an unwanted swerve in either direction. In the event of a nose wheel steering malfunction:

NOTE

- If STEER LOCK switch was used to engage nose wheel steering, depressing and then releasing the control wheel master switch (MSW) will disengage steering.
- If control wheel master switch (MSW) was used to engage nose wheel steering, releasing MSW will disengage steering.

At Normal Taxi Speeds:

1. Nose Wheel Steering — Disengage (use MSW).
2. Thrust Levers — IDLE.
3. Brake to a stop.
4. Taxi using differential braking and thrust.

During Takeoff:

1. Nose Wheel Steering — Disengage immediately (use MSW).
2. Continue takeoff using rudder and/or brakes for directional control.

GEAR UP LANDING

If a gear up landing must be made, select a long, wide runway with as little crosswind as possible. If time and conditions permit, plan the descent to ensure minimum fuel remaining on the aircraft. Ensure sufficient fuel for controlled, power-on approach.

CAUTION

If emergency gear extension has been selected, **do not** attempt to retract the landing gear. To do so may cause excessive air pressure to be introduced into the hydraulic system return lines, thereby rupturing the reservoir.

1. Notify controlling agency of the emergency.
2. Brief passengers as required:
   a. Location and operation of emergency exits.
   b. All loose items — Secure.
   c. Shoulder harness and seat belts — Secure.
   d. Emergency landing brace position.
3. NO SMOKING FASTEN SEAT BELT Switch — On.
4. CABIN AIR or CAB AIR Switch — OFF. The aircraft should be depressurized prior to landing.
5. Flaps — DN.

NOTE

The landing gear warning will sound and will not be mutable with any landing gear not down and the flaps full down.

GEAR UP LANDING (CONT)

6. EMER BAT or EMER PWR Switch(es) — OFF.
7. - **If no gear have extended**, touch down slightly nose high.
   - **If the nose gear fails to extend:**
     a. Relocate passengers aft to obtain aft CG, if possible.
     b. HYD PUMP Switch — On.
     c. Hold the nose off the runway as long as elevator control is available. If hydraulic pressure is available, normal braking may be available. Use rudder and/or brakes for directional control. Be prepared to use EMER BRAKE, refer to EMERGENCY BRAKING, Section III.
   - **If a main gear fails to extend**, land on the same side of the runway as the extended gear.
     a. HYD PUMP Switch — On.
     b. ANTI-SKID Switch — OFF.
     c. Hold the applicable wing up as long as possible. Maintain directional control with rudder and nose wheel steering. If hydraulic pressure is available, braking (anti-skid off) may be available. Refer to ANTI-SKID GEN LIGHT ILLUMINATED — ANTI-SKID OFF OPERATION, this section. Be prepared to use EMER BRAKE, refer to EMERGENCY BRAKING, Section III.
8. Perform normal power-on approach at VREF and touch down at the lowest possible airspeed with minimum sink rate. **Do not** decelerate below shaker speed.
9. Thrust Levers — CUTOFF at touchdown.
10. ENG PULL or ENG FIRE PULL T-handles — Pull.
11. After aircraft stops, Battery Switches — OFF.
12. Evacuate the aircraft:
    a. Cabin Entry Door — Open and exit aircraft. The upper door is openable with the landing gear retracted.
    b. Emergency Exit Window — Open and exit using the wing step area.

HYDRAULIC SYSTEM FAILURE LANDING

1. HYD PUMP Switch — On.
2. • **If auxiliary hydraulic pressure is available:**
   a. FLAP Setting — 20°.
   b. When maximum flap deflection (20° maximum) is obtained:
      (1) FLAP Switch — Neutral (if applicable).
      (2) HYD PUMP Switch — OFF.
      (3) Go to step 3.

   • **If auxiliary hydraulic pressure is *not* available:**
   a. HYD PUMP Switch — OFF.
   b. Go to step 3.
3. Final Approach Speed — As appropriate for flap deflection:
   Flaps — UP, VREF + 30.
   Flaps — 8°, VREF + 20.
   Flaps — 20°, VREF + 10.
4. Landing Distance — Multiply by 2.
5. Crew Approach Briefing — Complete.
6. EMER BRAKE Handle — Pull out of recess.

Just prior to landing:

7. HYD PUMP Switch — On.
8. Yaw Damper — OFF during landing flare.

After touchdown:

9. • **If hydraulic pressure is being maintained:**
   a. SPOILER Switch — EXT.
   b. Brakes — As required.

   • **If hydraulic pressure is *not* being maintained:**
   a. EMER BRAKE Handle — Push down slowly to apply brake pressure (handle must be pushed downward approximately 2 inches [5 centimeters] before braking action begins.) Apply brakes smoothly with small movements to produce improved feel and reduce the probability of tire skid. Do **not** pump the brake handle.
   b. Rudder and/or Nose Wheel Steering — As required for directional control.

NOTE Use of drag chute or thrust reversers (if installed) is recommended.

JAMMED STABILIZER LANDING

IF ELEVATOR PULL FORCE IS ENCOUNTERED — Stabilizer jammed in nose-down trim position (aircraft in climb or cruise configuration):

WARNING Control pressure will be heavy. Copilot assistance with this procedure is recommended. Anticipate highest pull forces (approximately 75 pounds) at landing flare.

1. Move C.G. aft if possible. Transfer fuel to the fuselage tank if possible.
2. Land as soon as practical to minimize forward C.G. movement.
3. Final Approach Configuration — Gear - DN, Flaps - 20°.
4. Final Approach Speed — VREF + 20.
5. Yaw Damper — OFF prior to landing.
6. Landing Distance — Multiply by 1.20.

IF ELEVATOR PUSH FORCE IS ENCOUNTERED — Stabilizer jammed in nose-up trim position (aircraft in landing configuration):

1. Move C.G. forward if possible. Transfer fuel to the wing tanks if possible.
2. Final Approach Configuration — Gear - DN, Flaps - DN.
3. Final Approach Speed — VREF.

ONE OR BOTH SPOILERS UP LANDING

1. Final Approach Configuration — Gear - DN, Flaps - UP.
2. Final Approach Speed — VREF + 40.
3. Yaw Damper — OFF prior to landing.
4. Landing Distance — Multiply by 1.50.

NOTE

- Aerodynamic braking at higher speeds will cause the aircraft to become airborne even with the spoilers extended.
- Use of drag chute or thrust reversers (if installed) is recommended.

PARTIAL FLAP LANDING

1. HYDRAULIC PRESSURE — Check.
   If pressure is low, refer to HYDRAULIC SYSTEM FAILURE/ ALTERNATE GEAR EXTENSION procedure and HYDRAULIC SYSTEM FAILURE LANDING procedure, this section.
   If pressure is normal,
   Final Approach Configuration — Gear - DN.
2. Final Approach Speed — As appropriate for flap deflection. If actual flap deflection falls between those listed, use the final approach speed for the lesser flap deflection.
3. Yaw Damper — OFF prior to landing.
4. Landing Distance — As appropriate for flap deflection.

Flap Deflection	Final Approach Speed	Multiply Landing Distance By
UP	VREF + 30	1.35
8°	VREF + 20	1.30
20°	VREF + 10	1.20

NOTE Use of drag chute or thrust reversers (if installed) is recommended.

SINGLE-ENGINE LANDING

1. Final Landing Configuration — Gear - DN, Flaps - 20°.
2. Approach Speed — VREF + 10.
3. Yaw Damper — OFF prior to landing.
4. Landing Distance — Multiply by 1.20.

STABILIZER HEAT FAILURE — LANDING

When landing with the flaps at 20° proceed as follows:

1. Final Approach Configuration — Gear - DN, Flaps - 20°.
2. Final Approach Speed — VREF + 10.
3. Yaw Damper — OFF prior to landing.
4. Landing Distance — Multiply by 1.10.

WING HEAT FAILURE — LANDING

1. Final Approach Configuration — Gear - DN, Flaps - DN.
2. Final Approach Speed — VREF + 15.
3. Touchdown Speed — 15 knots above normal.
4. Landing Distance — Multiply by 1.20.

WING AND STAB HEAT FAILURE — LANDING

1. Final Approach Configuration — Gear - DN, Flaps - 20°.
2. Final Approach Speed — VREF + 25.
3. Yaw Damper — OFF prior to landing.
4. Touchdown Speed — 25 knots above normal.
5. Landing Distance — Multiply by 1.30.

TURBULENT AIR PENETRATION

Flight through severe turbulence should be avoided if possible. When flying at 30,000 feet or higher, it is not advisable to avoid a turbulent area by climbing over it unless it is obvious that it can be overflown well in the clear. For turbulence of the same intensity, greater buffet margins are achieved by flying the recommended speeds at reduced altitude.

1. Airspeed — 250 KIAS or 0.73 MI whichever is less. Severe turbulence will cause large and often rapid variations in indicated airspeed. **Do not chase the airspeed.**
2. Thrust — AIR IGN Switches — On. Make an initial thrust setting for the target airspeed. **Change thrust only in the case of extreme airspeed variation.**
3. Attitude — Maintain wings level and desired pitch attitude. Use attitude indicator as the primary instrument. In extreme drafts, large altitude changes may occur. **Do not use sudden large control movements.**
4. Stabilizer — Maintain control of the airplane with the elevators. After establishing the trim setting for penetration speed, **do not change the stabilizer trim.**
5. Altitude — Allow the altitude to vary. Large altitude variations are possible in severe turbulence. Sacrifice altitude in order to maintain the desired attitude and airspeed. **Do not chase altitude.**
6. Autopilot and Yaw Damper:
    - PRI or SEC Yaw Damper — Engaged. Controllability of the aircraft in severe turbulence becomes more difficult with the yaw damper Off.
    - If severe turbulence is penetrated with Autopilot on, use attitude hold mode with soft (SFT) mode engaged.

OPERATION WITH ONE FUEL COMPUTER INOPERATIVE

The following text (operation with one fuel computer inoperative) is applicable to ferry flight only per applicable regulations.

In the event the electronic fuel computer becomes inoperative, the engine will be controlled manually. The protection offered by the electronic fuel computer will not be available when in the fuel computer off mode of operation or if the fuel computer is inoperative. Therefore, to complete a flight mission, the following procedures should be adhered to and extra caution must be exercised to ensure that engine limits are not exceeded.

Engine acceleration with the fuel computer off or inoperative is considerably slower than with the fuel computer on.

NOTE

The fuel computer provides electronic overspeed protection when the computer is inoperative. To obtain this protection, the manual mode dispatch switch on the face of the fuel computer should be set to the MANUAL position and the FUEL CMPTR switch set to On.

STARTING ENGINES

The engine with an inoperative fuel computer may be started using a GPU assist or from the aircraft batteries. Follow procedure for a normal engine start as outlined under STARTING ENGINES in SECTION II except for the following:

1. Affected engine FUEL CMPTR Switch — OFF. Note FUEL CMPTR light illuminated.

NOTE

If the manual mode switch on the face of the fuel computer has been set to MANUAL, set the FUEL CMPTR switch ON. In this configuration, electronic overspeed protection will be provided.

2. SPR is a fuel computer function and will be inoperative during fuel computer off mode.

OPERATION WITH ONE FUEL COMPUTER INOPERATIVE (CONT)

3. The fuel computer speed switch function which disengages the starter at 45% or 50% Turbine Speed (N2) will be inoperative. Therefore, during the start sequence perform the following:
   a. At 45% Turbine Speed (N2), START-GEN Switch — OFF. Check AIR IGN and START lights (if installed) out.

NOTE If START light remains illuminated, refer to STARTER ENGAGED LIGHT REMAINS ILLUMINATED AFTER START in this section.

BEFORE TAXI

Refer to BEFORE TAXI checklist in Section II and accomplish the fuel control governor check on appropriate engine.

TAXI AND BEFORE TAKEOFF

Taxi and before takeoff operations are conducted as described in Section II except as follows:

1. STANDBY PUMP Switch (affected engine) — ON.
2. JET PUMP Switch (affected engine) — Off.

NOTE By using the standby pump as the primary pump on the engine with the inoperative fuel computer, fuel control pneumatic circuit icing is prevented by recirculating fuel within the fuel control.

TAKEOFF

A takeoff using one engine with an inoperative fuel computer is accomplished in the same manner as a normal two engine takeoff; however, takeoff should be made from a standing start.

WARNING Do not dispatch if the required (full-rated or partial power) takeoff Fan Speed (N1) setting cannot be obtained.

NOTE

- Thrust lever mismatch may occur with both engines operating at takeoff power.
- Monitor engine instruments to ensure engine limits are not exceeded.

OPERATION WITH ONE FUEL COMPUTER INOPERATIVE (CONT)

CRUISE

Cruise operations with one fuel computer inoperative are conducted as described in Section II except for fuel transfer. Normal fuel transfers may be accomplished at cruise power settings with one fuel computer off as follows:

NOTE

- Monitor turbine (N2) and fan (N1) speed during fuel transfer.
- Before switching JET PUMP switch to ON, ensure steady engine operation at 80% N1 or above.

1. JET PUMP Switch (affected engine) — ON.
2. STANDBY PUMP Switch (affected engine) — Off.
3. Cross flow or transfer fuel as required.
4. STANDBY PUMP Switch (affected engine) — ON.
5. JET PUMP Switch (affected engine) — Off.

APPROACH

Refer to Section II for APPROACH checklist. If required, accomplish fuel balance in accordance with fuel transfer procedures under CRUISE above.

GO AROUND (ONE OR TWO ENGINE)

A go-around with one fuel computer inoperative is flown as described in Section II.

WARNING

Engine acceleration is considerably slower with the fuel computer inoperative.

NOTE

Monitor engine instruments while advancing thrust levers.

OPERATION WITH NOSE WHEEL STEERING INOPERATIVE

The aircraft may be operated with the nose wheel steering inoperative provided:

- DC power is available (NOSE STEER circuit breaker [pilot's main bus] — Set) to supply nose wheel shimmy damping.
- The anti-skid system is operating normally.

TAXI AND BEFORE TAKEOFF

Taxi operations are relatively easy using differential braking and power. Avoid sharp turns, if possible.

NOTE

When taxiing without the nose wheel steering system engaged, it is possible to cause the nose wheel to turn 180° from the desired straight ahead position as the nose wheel free castors when the electric steering system is not engaged. If takeoff is performed with the nose wheel in this position, the uplock will not engage.

RUNWAY LINEUP

Visually ensure nose gear uplock is forward.

TAKEOFF

For takeoff, taxi on runway centerline for a short distance to ensure the nose wheel is straight, before applying takeoff power.

SECTION V — PERFORMANCE DATA

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INTRODUCTION TO PERFORMANCE DATA

REGULATORY COMPLIANCE

Information in this section is presented for the purpose of compliance with the appropriate performance criteria and certification requirements of FAR 25.

STANDARD PERFORMANCE CONDITIONS

All performance in this section is based on the following performance conditions:

1. Pertinent thrust ratings less installation, airbleed, and accessory losses.
2. Full temperature accountability within the operational limits for which the airplane is certified.

NOTE Should OAT be below the lowest temperature shown on the performance charts, use performance at the lowest temperature shown.

3. Wing flap positions are as follows:
   Takeoff . . . . 8° or 20°
   Enroute . . . . .UP — 0°
   Approach. . . . . .20°
   Landing . . . . DN — 40°
4. Power settings (N1) from appropriate charts or tables.

VARIABLE FACTORS AFFECTING PERFORMANCE

Details of variables affecting performance are given with the charts to which they apply. Conditions which relate to all performance calculations are:

1. Cabin pressurized.
2. Effect of humidity.
3. Winds, for which graphical correction is presented on the charts, are to be taken as the tower winds (20 feet above runway surface). Factors for 50% headwind component and 150% tailwind component have been applied as prescribed in pertinent regulations.
4. The percentages of stall speed are calculated from speeds as expressed in calibrated airspeed (KCAS).

DEFINITIONS

The following definitions apply to terms used throughout this manual.

AIRSPEEDS

CAS	Calibrated Airspeed — The airspeed indicator reading corrected for instrument and position error. KCAS is calibrated airspeed expressed in knots.
IAS	Indicated Airspeed — The airspeed indicator reading as installed in the airplane. KIAS is indicated airspeed expressed in knots. The information in this manual is presented in terms of indicated airspeed, unless otherwise stated, and assumes zero instrument error.
M	Calibrated Mach Number — The Machmeter reading corrected for instrument and position error.
M_I	Indicated Mach Number — The Machmeter reading as installed in the airplane. Zero instrument error is assumed for presentations in this section of the manual.
V_A	Maneuvering Speed — V_A is the highest speed that full aileron and rudder control can be applied without overstressing the aircraft, or the speed at which the aircraft will stall with the load factor of 3.0 g's at maximum gross weight, whichever is less.
V_{LOF}	Liftoff Speed — The actual speed of the aircraft at liftoff.
V_{S0}	V_{S0} is the stalling speed in the landing configuration.
V_{S1}	V_{S1} is the stalling speed in the appropriate gear/flap configuration.
V_{MCA}	Minimum Control Speed, Air — The minimum flight speed at which the airplane is controllable with 5° of bank when one engine suddenly becomes inoperative and the remaining engine is operating at takeoff thrust.
V_{MCG}	Minimum Control Speed, Ground — The minimum speed on the ground at which control can be maintained using aerodynamic controls alone, when one engine suddenly becomes inoperative and the remaining engine is operating at takeoff thrust.
V_{MO}/M_{MO}	Maximum Operating Limit Speed — The speed that shall not be deliberately exceeded in any regime of flight (climb, cruise or descent) unless a higher speed is authorized for flight test. V_{MO} is expressed in knots and M_{MO} is expressed in Mach number.

DEFINITIONS (CONT)

V1	Critical Engine Failure Speed — The speed at which, due to engine failure, the pilot is assumed to elect to stop or continue the takeoff. If engine failure occurs at V1 the distance to continue the takeoff to 35 feet above the runway surface will be equal to the distance to bring the airplane to a full stop. V1 must not be less than the critical minimum control speed (VMCG) or greater than the rotation speed (VR).
VR	Rotation Speed — The speed at which rotation is initiated during takeoff to attain V2 at or before a height of 35 feet above the runway surface.
V2	Takeoff Safety Speed — The actual speed at 35 feet above the runway surface as demonstrated in flight during single-engine takeoff. V2 must not be less than 1.2 times the stalling speed, or less than 1.1 times the air minimum control speed (VMCA), or less than the rotation speed (VR) plus an increment in speed attained prior to reaching a 35-foot height above the runway surface.
VAPP	Approach Climb Speed — The airspeed equal to 1.3 VS1 (airplane in the approach configuration).
VREF	Landing Approach Speed — The airspeed equal to 1.3 VS0 (airplane in the landing configuration).

WEIGHTS

Maximum Allowable Takeoff Weight	The maximum allowable takeoff weight at the start of takeoff roll is limited by the most restrictive of the following requirements:

- Maximum Certified Takeoff Weight.
- Maximum Takeoff Weight (Climb or Brake Energy Limited) for altitude and temperature as determined from the applicable figure entitled TAKEOFF WEIGHT LIMITS in Section V.
- Maximum Takeoff Weight for the runway and ambient conditions as determined from the applicable figure entitled TAKEOFF DISTANCE in Section V.
- Maximum Takeoff Weight for obstacle clearance as determined from the applicable TAKEOFF FLIGHT PATH and CLIMB GRADIENT figures in Section V. (FAR 121 and 135 as applicable to U.S. registered aircraft.)

DEFINITIONS (CONT)

Maximum Allowable Landing Weight	The maximum allowable landing weight is limited by the most restrictive of the following requirements: • Maximum Certified Landing Weight. • Maximum Landing Weight for the runway and ambient conditions as determined from the applicable ACTUAL LANDING DISTANCE and FACTORED LANDING DISTANCE (if applicable) charts in Section V. • Maximum Landing Weight (Approach Climb or Brake Energy Limited) for altitude and temperature as determined from the applicable figure entitled LANDING WEIGHT LIMITS in Section V.

DISTANCES

Accelerate-Stop Distance	The accelerate-stop distance is the horizontal distance traversed from brake release to the point at which the airplane comes to a complete stop on a takeoff during which one engine fails at V1 and the pilot elects to stop.
Engine-Out Accelerate-Go Distance	The engine-out accelerate-go distance is the horizontal distance traversed from brake release to the point at which the airplane attains a height of 35 feet above the runway surface, on a takeoff during which one engine fails at V1 and the pilot elects to continue.
Takeoff Field Length	The takeoff field lengths presented in this section are based on a smooth, dry, paved runway. The takeoff field length given for each combination of airplane weight, atmospheric temperature, altitude, wind, and runway gradient is the greatest of the following: 1. 115% of the all-engine takeoff distance from start to a height of 35 feet above the runway surface. 2. The accelerate-stop distance. 3. The engine-out accelerate-go distance. No specific identification is made on the charts as to which of the above distances governs a specific case. However, in all cases for which charts are furnished, the field length is governed by either 2 or 3 above as the all-engine takeoff distance is shorter than either.
Actual Landing Distance	The actual landing distances presented in this section are based on a smooth, dry, paved runway. The landing field length is equal to the horizontal distance from a point 50 feet above the runway surface to the point at which the airplane would come to a full stop on the runway.

DEFINITIONS (CONT)

Factored Landing Distance	The factored landing distances presented in this section are equal to the actual landing distance divided by 0.60 (multiplied by 1.67).

METEOROLOGICAL

ISA	International Standard Atmosphere.
OAT	Outside Air Temperature — The free air static temperature obtained from either ground meteorological sources or from inflight temperature indications adjusted for instrument error and compressibility effects.
RAT	Ram Air Temperature — The static air temperature corrected for full adiabatic compression rise corresponding to the calibrated Mach number, and multiplied by a recovery factor.
Altitude	All altitudes given in this section are pressure altitudes unless otherwise stated.
Wind	The wind velocities recorded as variables on the charts of this section are to be understood as the headwind or tailwind components of the actual winds at 20 feet above the runway surface (tower winds).
Demonstrated Crosswind	The demonstrated crosswind velocity of 24.7 knots is the velocity of the reported tower winds (measured at a 20-foot height) for which adequate control of the airplane during takeoff and landing was actually demonstrated during certification tests. The value shown is not considered to be limiting.

MISCELLANEOUS

Position Correction	Static Position Correction — A correction applied to indicated airspeed or altitude to eliminate the effect of the location of the static pressure source on the instrument reading. Since all airspeeds and altitudes in this section are presented as "indicated" values, no position corrections need be made when reading from the charts. Any change in the airspeed-altitude system external to the airplane, or locating any external object near the pressure pickup sources, requires calibration of the system and revision of the charts.
Runway Gradient	Change in runway elevation per 100 feet of runway length. The values given are positive for uphill gradients and negative for downhill gradients.

DEFINITIONS (CONT)

Gradient of Climb	The ratio of the change in height during a portion of the climb to the horizontal distance traversed in the same time interval.
Gross Climb Gradient	The climb gradient that the airplane can actually achieve given ideal conditions.
Net Climb Gradient	The gross climb gradient reduced by 0.8% during the takeoff phase and 1.1% enroute. This conservatism is required by FAR 25 for terrain clearance determination to account for variables encountered in service.
First Segment Climb	Climb from the point at which the airplane becomes airborne to the point at which the landing gear is fully retracted. The gross climb gradient must be positive, without ground effect. This requirement is satisfied by observing the TAKEOFF WEIGHT LIMITS Chart. Velocity increase is from VLOF to V2 with gradient calculated at liftoff velocity (VLOF).
Second Segment Climb	Climb extending from the end of the first segment to a height of at least 400 feet. The gross climb gradient may not be less than 2.4%. This requirement is satisfied by observing the TAKEOFF WEIGHT LIMITS Chart. Velocity for this segment is V2.
Final Segment Climb	Climb extending from the end of the second segment to a height of at least 1500 feet. The gross climb gradient may not be less than 1.2%. This requirement is satisfied by observing the TAKEOFF WEIGHT LIMITS Chart. Velocity for this segment is 1.25 VS1.
Enroute Climb	Climb with flaps UP (0°), landing gear retracted and maximum continuous thrust on one engine. There is no minimum requirement for enroute climb gradients. The enroute net climb gradients are presented for pilot's reference. Velocity is presented in ENROUTE CLIMB SPEED SCHEDULE Chart.
Approach Climb	Climb from a missed or aborted approach with approach (20°) flaps, landing gear retracted, and takeoff thrust on one engine. The gross climb gradient may not be less than 2.1%. This requirement is satisfied by observing the LANDING WEIGHT LIMITS Chart. Velocity for this segment is 1.3 VS1.

DEFINITIONS (CONT)

Landing Climb	Climb from an aborted landing with landing flaps DN (40°), landing gear extended, and takeoff thrust on both engines. The gross climb gradient may not be less than 3.2%. This requirement is satisfied by observing the LANDING WEIGHT LIMITS Chart. Velocity for this segment is 1.3 VSO.
Configurations	The configurations referred to by name in the charts correspond to the following settings:

Configuration	No. of Engines Operating	Thrust	Flap Setting	Gear
1st Segment Takeoff Climb	1	Takeoff	8° or 20°	DN
2nd Segment Takeoff Climb	1	Takeoff	8° or 20°	UP
Final Segment Climb	1	Max. Cont.	UP-0°	UP
Enroute Climb	1	Max. Cont.	UP-0°	UP
Approach Climb	1	Takeoff	20°	UP
Landing Climb	2	Takeoff	DN-40°	DN

NOISE LEVELS

The noise levels are in compliance with the requirements of FAR 36 (Stage 3) which are essentially equivalent to the requirements outlined in ICAO Annex 16, Chapter 3.

NOISE LEVEL IN EPNdb

CONDITION	ACTUAL	MAXIMUM ALLOWABLE
Takeoff (no thrust cutback)		
18,000 lb	83.6	93
18,300 lb	83.9	93
Takeoff (thrust cutback)		
18,000 lb	78.7	93
18,300 lb	79.2	93
Sideline		
18,000 lb	87.4	102
18,300 lb	86.7	102
Approach		
14,300 lb	91.3	102
15,300 lb	91.4	102

No determination has been made by the Federal Aviation Administration that the noise levels in this manual are or should be acceptable or unacceptable for operation at, into, or out of any airport. These noise values are stated for reference conditions of standard atmospheric pressure at sea level, 77°F (25°C) ambient temperature, 70% relative humidity, and zero wind.

Takeoff and sideline noise levels were obtained at the maximum takeoff weights of 18,000 pounds (8165 Kg) and 18,300 pounds (8300 Kg), V_2 + 10 knots climb speed, 8° flaps, anti-ice system off, and all engine takeoff with takeoff thrust setting. Thrust cutback was not required for compliance.

Thrust cutback noise levels were obtained by initiating cutback at approximately 2800 feet above runway elevation for 18,000 pound (8165 Kg) takeoff weight and approximately 2750 feet for 18,300 pound (8300 Kg) takeoff weight. Thrust cutback power settings were 85.5% N_1 and 85.9% N_1 respectively.

Landing approach noise levels were established on a 3° glideslope, gear down, maximum landing weight of 14,300 pounds (6486 Kg) and 15,300 pounds (6940 Kg), approach speed of 1.3 V_S + 10 knots, and 40° flaps. No special noise abatement procedures were used.

RELATION OF TEMPERATURE TO ISA

EXAMPLE:

OAT .... -22°C

Altitude .... 17,000 FT

Temperature .... ISA -4°C

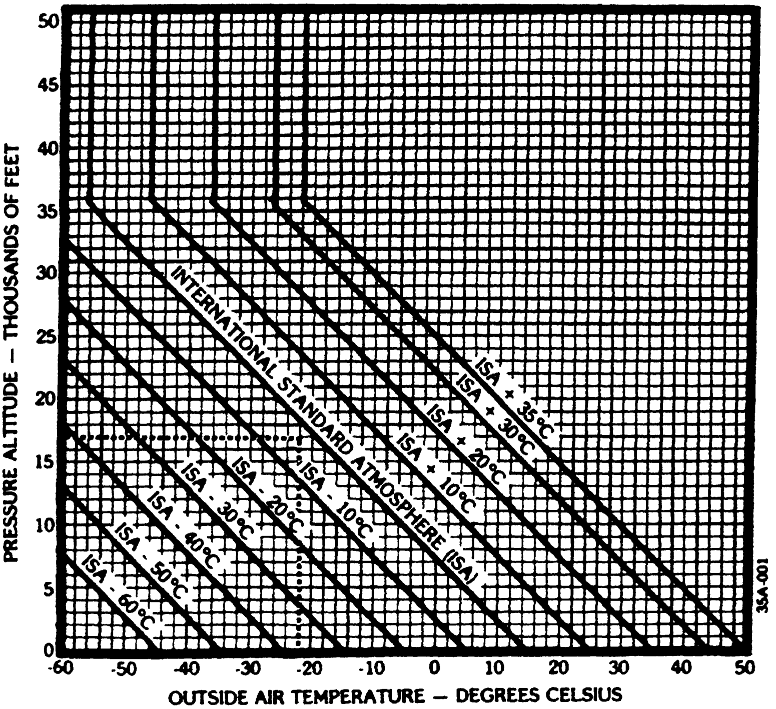


Figure 5-1

TEMPERATURE CONVERSION

- To convert from Celsius to Fahrenheit, find, in the bold face columns, the number representing the Celsius temperature to be converted. The equivalent Fahrenheit temperature is read in the adjacer column headed °F.
- To convert from Fahrenheit to Celsius, find, in the bold face columns, the number representing the Fahrenheit temperature to be converted The equivalent Celsius temperature is read in the adjacer column headed °C.

°F		°C	°F		°C	°F		°C	°F		°C	°F		°C
-148.0	**-100**	-73.3	-58.0	**-50**	-45.6	32.0	**0**	-17.8	122.0	**50**	10.0	212.0	**100**	37.8
-146.2	**-99**	-72.8	-56.2	**-49**	-45.0	33.8	**1**	-17.2	123.8	**51**	10.6	213.8	**101**	38.3
-144.4	**-98**	-72.2	-54.4	**-48**	-44.4	35.6	**2**	-16.7	125.6	**52**	11.1	215.6	**102**	38.9
-142.6	**-97**	-71.7	-52.6	**-47**	-43.9	37.4	**3**	-16.1	127.4	**53**	11.7	217.4	**103**	39.4
-140.8	**-96**	-71.1	-50.8	**-46**	-43.3	39.2	**4**	-15.6	129.2	**54**	12.2	219.2	**104**	40.0
-139.0	**-95**	-70.6	-49.0	**-45**	-42.8	41.0	**5**	-15.0	131.0	**55**	12.8	221.0	**105**	40.6
-137.2	**-94**	-70.0	-47.2	**-44**	-42.2	42.8	**6**	-14.4	132.8	**56**	13.3	222.8	**106**	41.1
-135.4	**-93**	-69.4	-45.4	**-43**	-41.7	44.6	**7**	-13.9	134.6	**57**	13.9	224.6	**107**	41.7
-133.6	**-92**	-68.9	-43.6	**-42**	-41.1	46.4	**8**	-13.3	136.4	**58**	14.4	226.4	**108**	42.2
-131.8	**-91**	-68.3	-41.8	**-41**	-40.6	48.2	**9**	-12.8	138.2	**59**	15.0	228.2	**109**	42.8
-130.0	**-90**	-67.8	-40.0	**-40**	-40.0	50.0	**10**	-12.2	140.0	**60**	15.6	230.0	**110**	43.3
-128.2	**-89**	-67.2	-38.2	**-39**	-39.4	51.8	**11**	-11.7	141.8	**61**	16.1	231.8	**111**	43.9
-126.4	**-88**	-66.7	-36.4	**-38**	-38.9	53.6	**12**	-11.1	143.6	**62**	16.7	233.6	**112**	44.4
-124.6	**-87**	-66.1	-34.6	**-37**	-38.3	55.4	**13**	-10.6	145.4	**63**	17.2	235.4	**113**	45.0
-122.8	**-86**	-65.6	-32.8	**-36**	-37.8	57.2	**14**	-10.0	147.2	**64**	17.8	237.2	**114**	45.6
-121.0	**-85**	-65.0	-31.0	**-35**	-37.2	59.0	**15**	-9.4	149.0	**65**	18.3	239.0	**115**	46.1
-119.2	**-84**	-64.4	-29.2	**-34**	-36.7	60.8	**16**	-8.9	150.8	**66**	18.9	240.8	**116**	46.7
-117.4	**-83**	-63.9	-27.4	**-33**	-36.1	62.6	**17**	-8.3	152.6	**67**	19.4	242.6	**117**	47.2
-115.6	**-82**	-63.3	-25.6	**-32**	-35.6	64.4	**18**	-7.8	154.4	**68**	20.0	244.4	**118**	47.8
-113.8	**-81**	-62.8	-23.8	**-31**	-35.0	66.2	**19**	-7.2	156.2	**69**	20.6	246.2	**119**	48.3
-112.0	**-80**	-62.2	-22.0	**-30**	-34.4	68.0	**20**	-6.7	158.0	**70**	21.1	248.0	**120**	48.9
-110.2	**-79**	-61.7	-20.2	**-29**	-33.9	69.8	**21**	-6.1	159.8	**71**	21.7	249.8	**121**	49.4
-108.4	**-78**	-61.1	-18.4	**-28**	-33.3	71.6	**22**	-5.6	161.6	**72**	22.2	251.6	**122**	50.0
-106.6	**-77**	-60.6	-16.6	**-27**	-32.8	73.4	**23**	-5.0	163.4	**73**	22.8	253.4	**123**	50.6
-104.8	**-76**	-60.0	-14.8	**-26**	-32.2	75.2	**24**	-4.4	165.2	**74**	23.3	255.2	**124**	51.1
-103.0	**-75**	-59.4	-13.0	**-25**	-31.7	77.0	**25**	-3.9	167.0	**75**	23.9	257.0	**125**	51.7
-101.2	**-74**	-58.9	-11.2	**-24**	-31.1	78.8	**26**	-3.3	168.8	**76**	24.4	258.8	**126**	52.2
-99.4	**-73**	-58.3	-9.4	**-23**	-30.6	80.6	**27**	-2.8	170.6	**77**	25.0	260.6	**127**	52.8
-97.6	**-72**	-57.8	-7.6	**-22**	-30.0	82.4	**28**	-2.2	172.4	**78**	25.6	262.4	**128**	53.3
-95.8	**-71**	-57.2	-5.8	**-21**	-29.4	84.2	**29**	-1.7	174.2	**79**	26.1	264.2	**129**	53.9
-94.0	**-70**	-56.7	-4.0	**-20**	-28.9	86.0	**30**	-1.1	176.0	**80**	26.7	266.0	**130**	54.4
-92.2	**-69**	-56.1	-2.2	**-19**	-28.3	87.8	**31**	-0.6	177.8	**81**	27.2	267.8	**131**	55.0
-90.4	**-68**	-55.6	-0.4	**-18**	-27.8	89.6	**32**	0.0	179.6	**82**	27.8	269.6	**132**	55.6
-88.6	**-67**	-55.0	1.4	**-17**	-27.2	91.4	**33**	0.6	181.4	**83**	28.3	271.4	**133**	56.1
-86.8	**-66**	-54.4	3.2	**-16**	-26.7	93.2	**34**	1.1	183.2	**84**	28.9	273.2	**134**	56.7
-85.0	**-65**	-53.9	5.0	**-15**	-26.1	95.0	**35**	1.7	185.0	**85**	29.4	275.0	**135**	57.2
-83.2	**-64**	-53.3	6.8	**-14**	-25.6	96.8	**36**	2.2	186.8	**86**	30.0	276.8	**136**	57.8
-81.4	**-63**	-52.8	8.6	**-13**	-25.0	98.6	**37**	2.8	188.6	**87**	30.6	278.6	**137**	58.3
-79.6	**-62**	-52.2	10.4	**-12**	-24.4	100.4	**38**	3.3	190.4	**88**	31.1	280.4	**138**	58.9
-77.8	**-61**	-51.7	12.2	**-11**	-23.9	102.2	**39**	3.9	192.2	**89**	31.7	282.2	**139**	59.4
-76.0	**-60**	-51.1	14.0	**-10**	-23.3	104.0	**40**	4.4	194.0	**90**	32.2	284.0	**140**	60.0
-74.2	**-59**	-50.6	15.8	**-9**	-22.8	105.8	**41**	5.0	195.8	**91**	32.8	285.8	**141**	60.6
-72.4	**-58**	-50.0	17.6	**-8**	-22.2	107.6	**42**	5.6	197.6	**92**	33.3	287.6	**142**	61.1
-70.6	**-57**	-49.4	19.4	**-7**	-21.7	109.4	**43**	6.1	199.4	**93**	33.9	289.4	**143**	61.7
-68.8	**-56**	-48.9	21.2	**-6**	-21.1	111.2	**44**	6.7	201.2	**94**	34.4	291.2	**144**	62.2
-67.0	**-55**	-48.3	23.0	**-5**	-20.6	113.0	**45**	7.2	203.0	**95**	35.0	293.0	**145**	62.8
-65.2	**-54**	-47.8	24.8	**-4**	-20.0	114.8	**46**	7.8	204.8	**96**	35.6	294.8	**146**	63.3
-63.4	**-53**	-47.2	26.6	**-3**	-19.4	116.6	**47**	8.3	206.6	**97**	36.1	296.6	**147**	63.9
-61.6	**-52**	-46.7	28.4	**-2**	-18.9	118.4	**48**	8.9	208.4	**98**	36.7	298.4	**148**	64.4
-59.8	**-51**	-46.1	30.2	**-1**	-18.3	120.2	**49**	9.4	210.2	**99**	37.2	300.2	**149**	65.0

Figure 5-2

RAM AIR TO OUTSIDE AIR TEMPERATURE CONVERSION
(RAT TO OAT)

EXAMPLE:

1. Indicated RAT.......................................40°C
2. Indicated Mach No.........................0.50 M
3. OAT...25.4°C

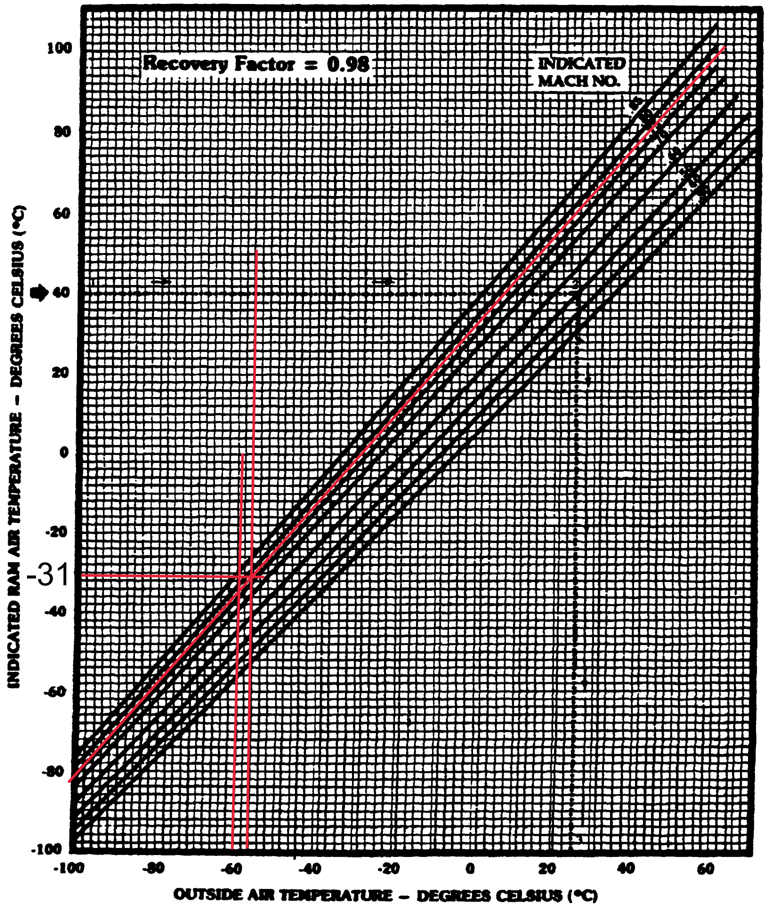


Figure 5-3

EXAMPLE:

1. Indicated Airspeed . . . . 250 KIAS
2. Calibrated Airspeed . . . . 249 KCAS
   Position Correction . . . . (Minus) 1 KTS

AIRSPEED CALIBRATION
FLAPS UP — GEAR UP

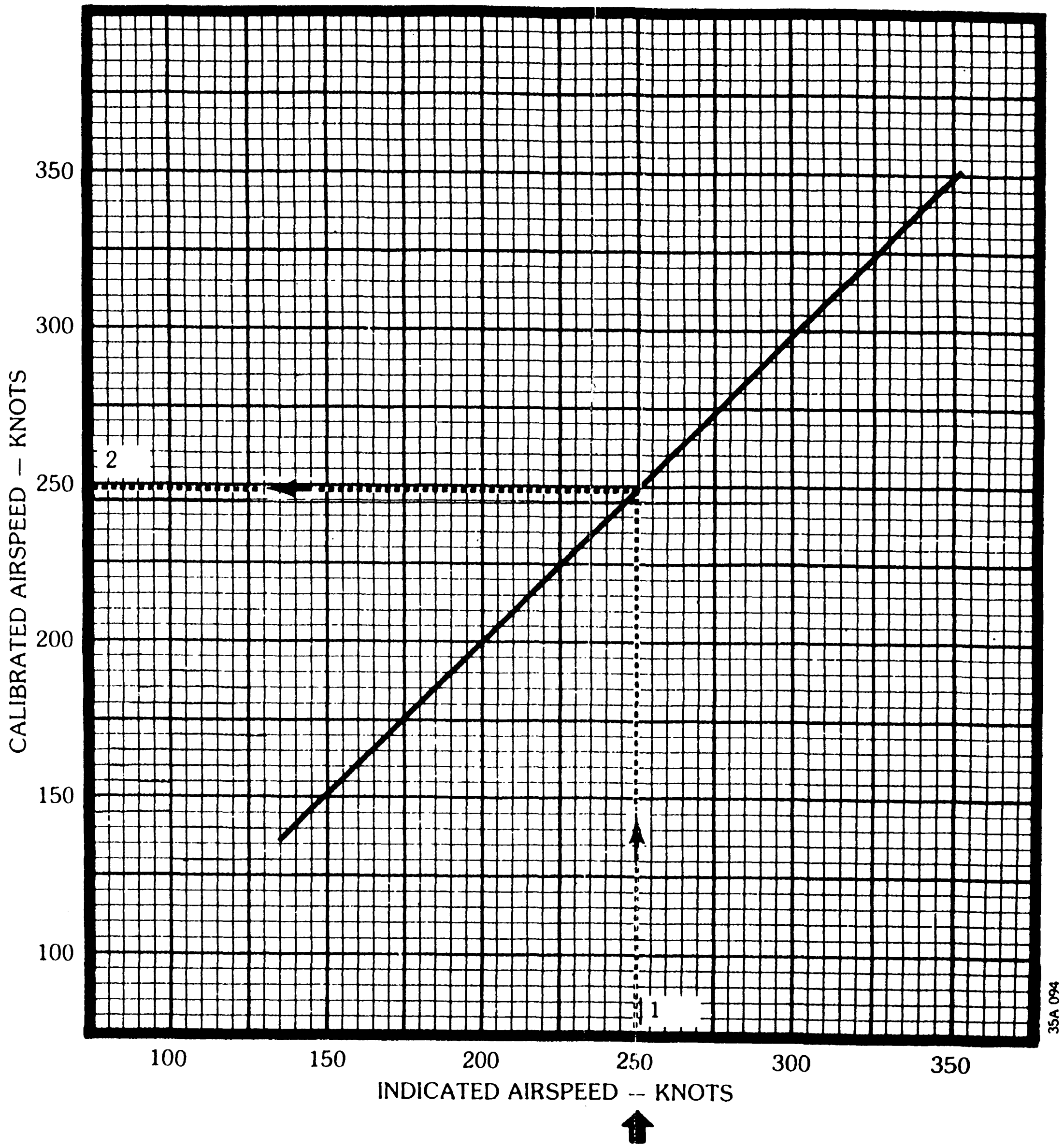


Figure 5-4

AIRSPEED CALIBRATION FLAPS (8°, 20° or DOWN 40°) GEAR UP or DN

EXAMPLE:

1. Indicated Airspeed .... 150 KIAS
2. Calibrated Airspeed .... 150 KCAS
   Position Correction .... 0 KT

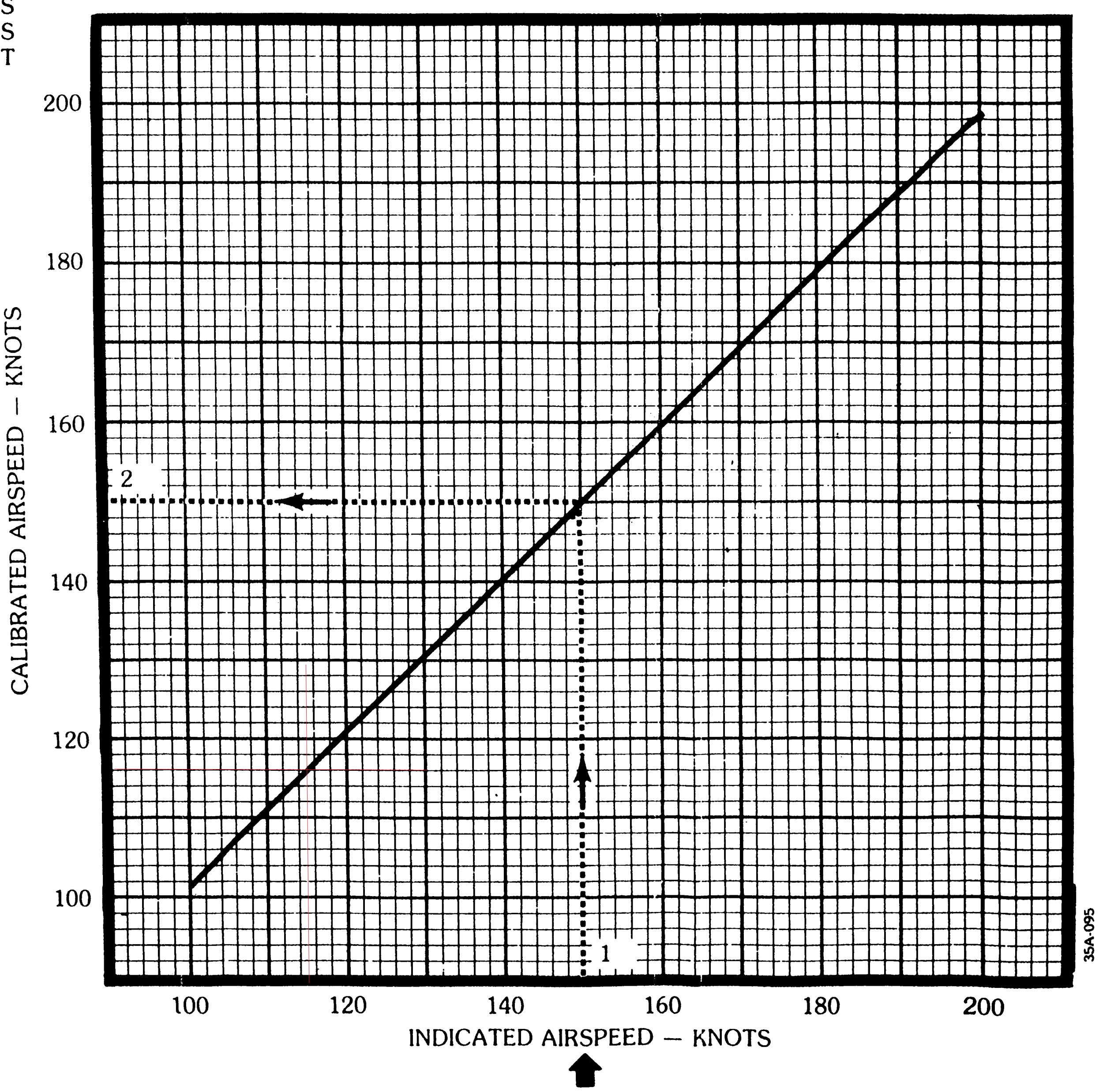


Figure 5-5

GROUND AIRSPEED CALIBRATION
FLAPS (8° or 20°) GEAR DOWN

EXAMPLE:

1. Indicated Airspeed . . . . 130 KIAS
2. Calibrated Airspeed . . . . 128 KCAS
   Position Correction . . . . (Minus) 2 KTS

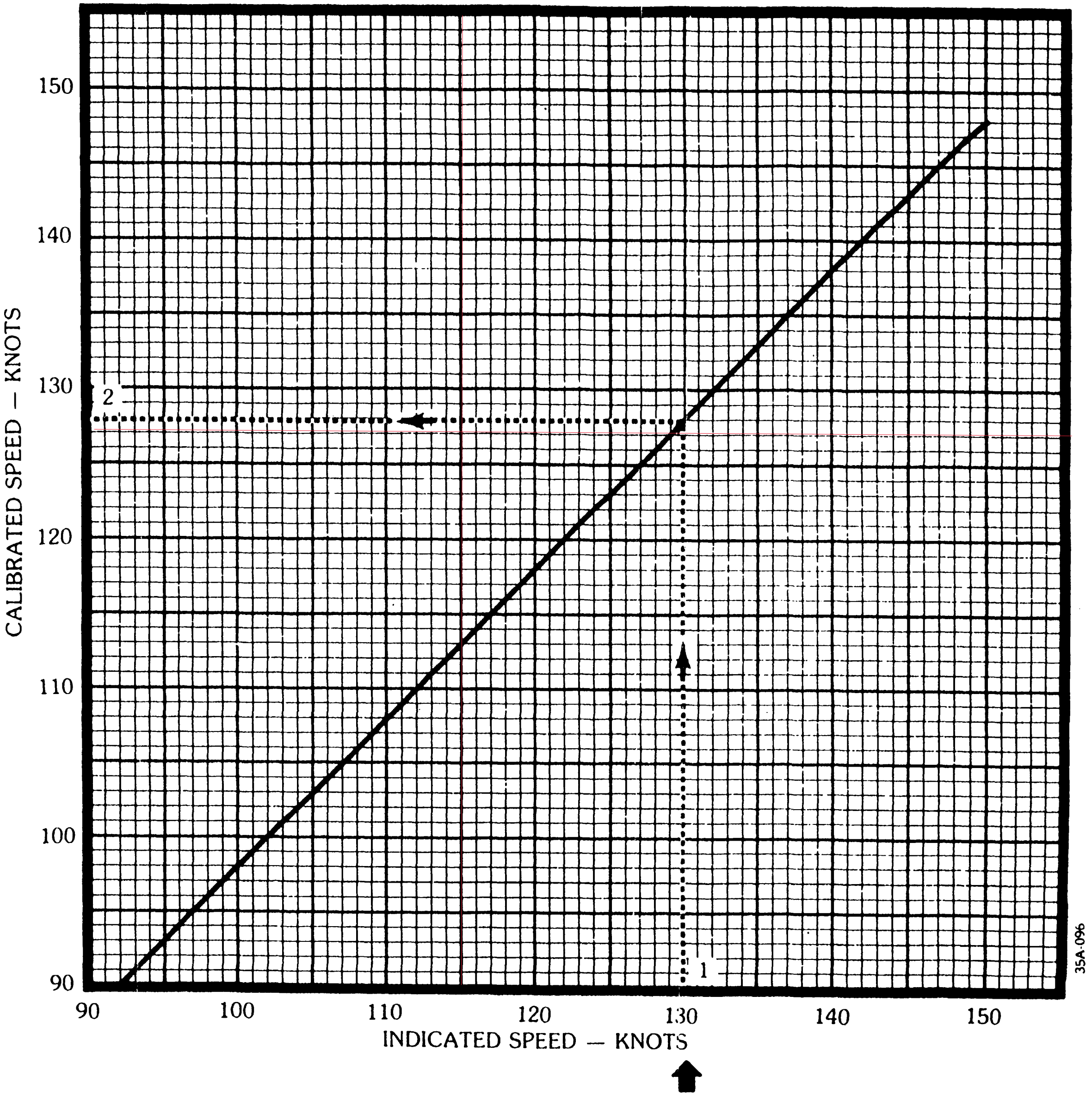


Figure 5-6

MACH CALIBRATION
FLAPS – UP GEAR – UP

EXAMPLE:

1. Indicated Mach No. .0.70 M_I
2. Calibrated Mach No . . . . .0.695 M_C
   Position Correction . . . . (Minus) 0.005 MACH

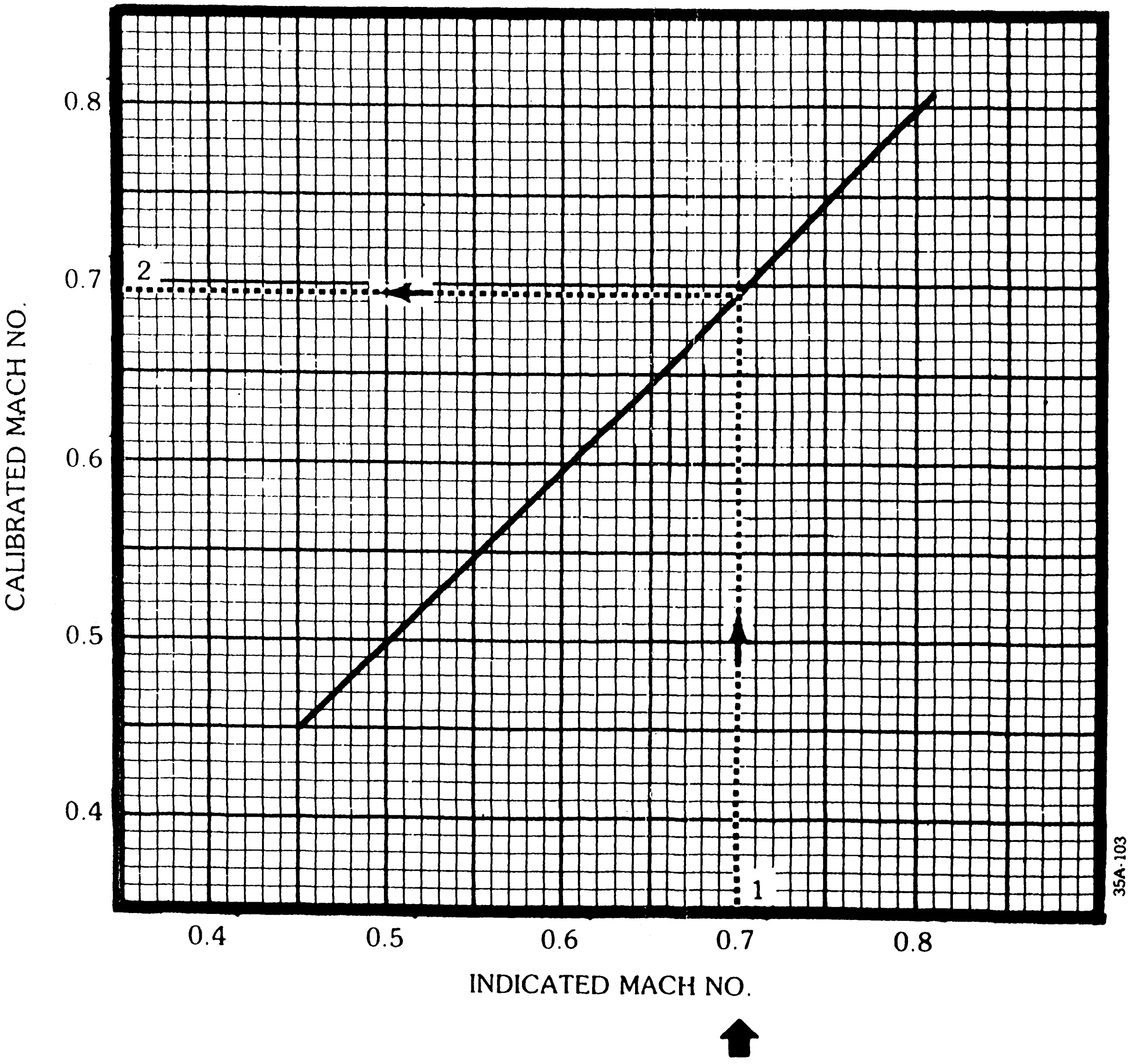


Figure 5-7

ALTITUDE POSITION CORRECTION FLAPS UP – GEAR UP

EXAMPLE:

1. Indicated Airspeed . . . . .300 KIAS
2. Indicated Altitude .30000 FT
3. Position Correction . . . .(Minus) 11 FT

   Actual Altitude . . . . .29989 FT

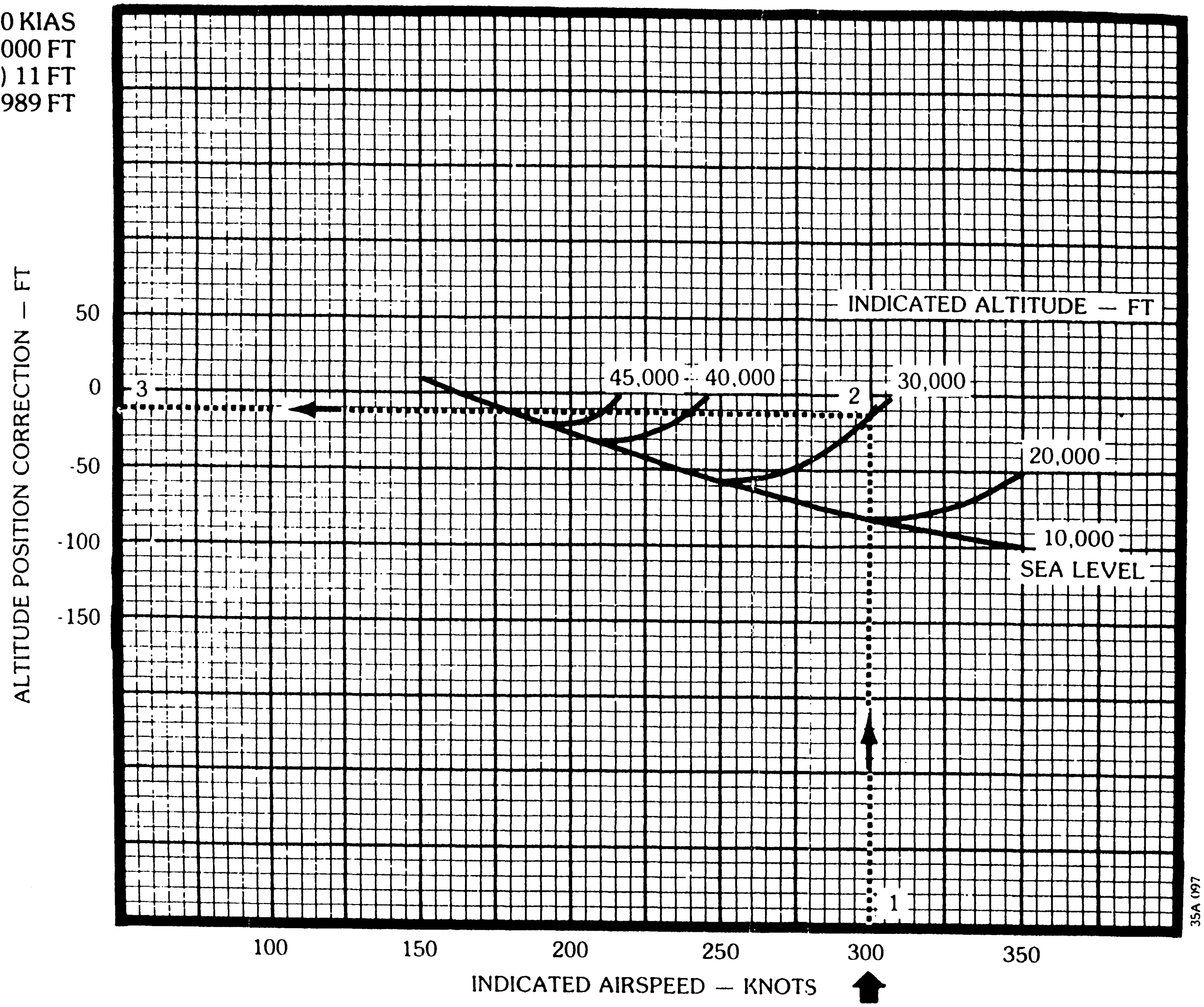


Figure 5-8

ALTITUDE POSITION CORRECTION FLAPS (8°, 20° or DOWN 40° GEAR UP or DN

EXAMPLE:

Indicated Altitude .... 5000 FT
1. Flaps .... 8°
2. Indicated Airspeed .... 170 KIAS
3. Position Correction .... (Minus) 10 FT

Actual Altitude .... 4990 FT

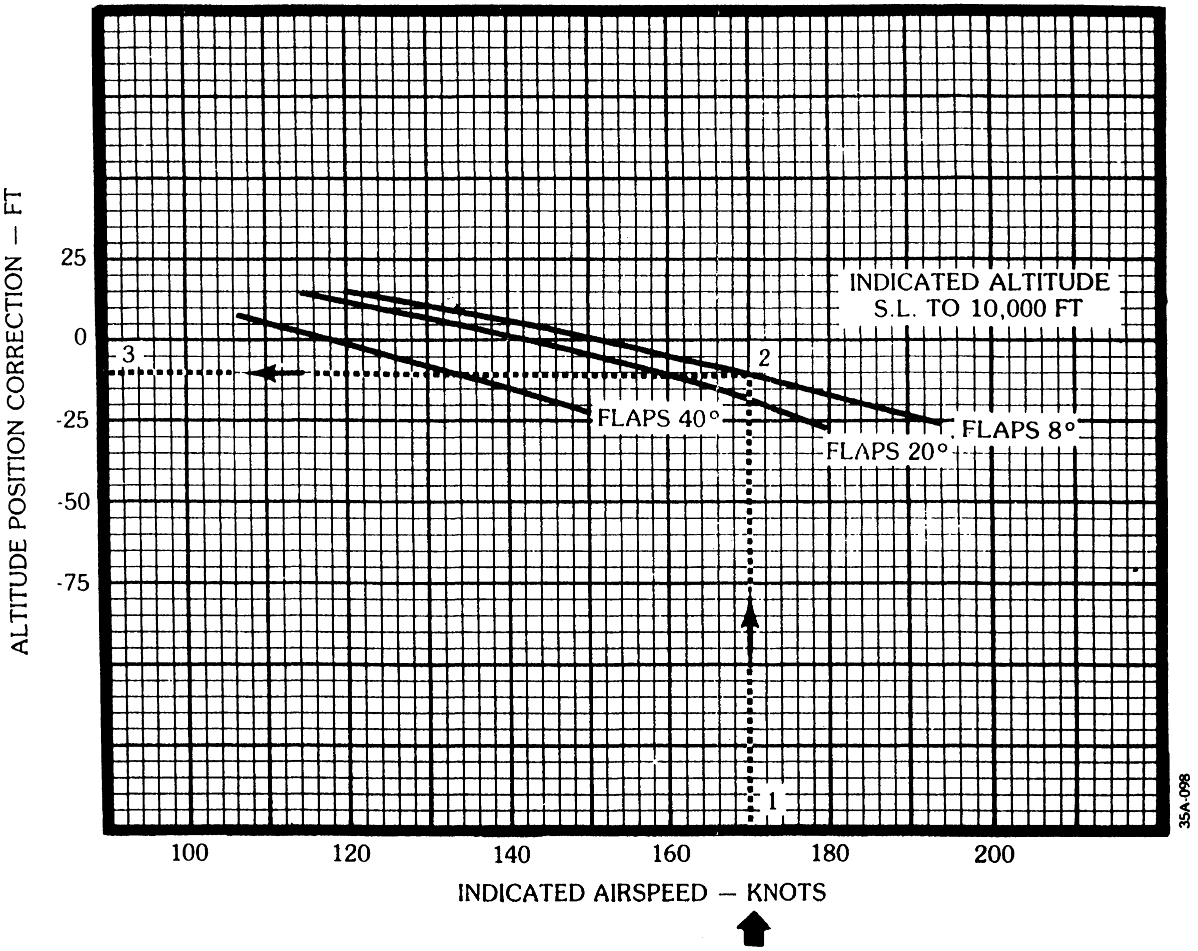
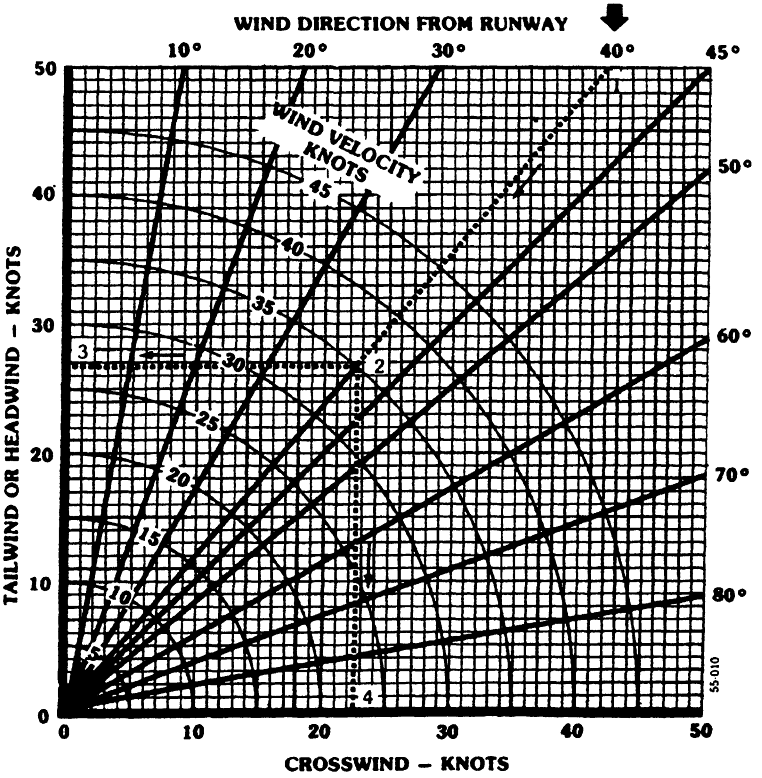


Figure 5-9

WIND COMPONENTS



CONDITIONS:

- Wind Velocity .... 35 Knots
- Wind Direction .... 300°
- Runway Heading .... 340°

EXAMPLE:

1. Wind Direction from Runway (See Note) .... 40°
2. Wind Velocity .... 35 Knots
3. Headwind Component .... 26.7 Knots
4. Crosswind Component .... 22.5 Knots

NOTE: To calculate wind direction from runway, subtract wind direction from runway heading. Enter the chart at the absolute value of wind direction from runway.

Figure 5-10

EXAMPLE:

1. Weight . . . . 15,800 Lb
2. Flaps . . . . 8°
3. Stall Speed . . . . 109.0 KIAS

STALL SPEEDS – GEAR UP or DN

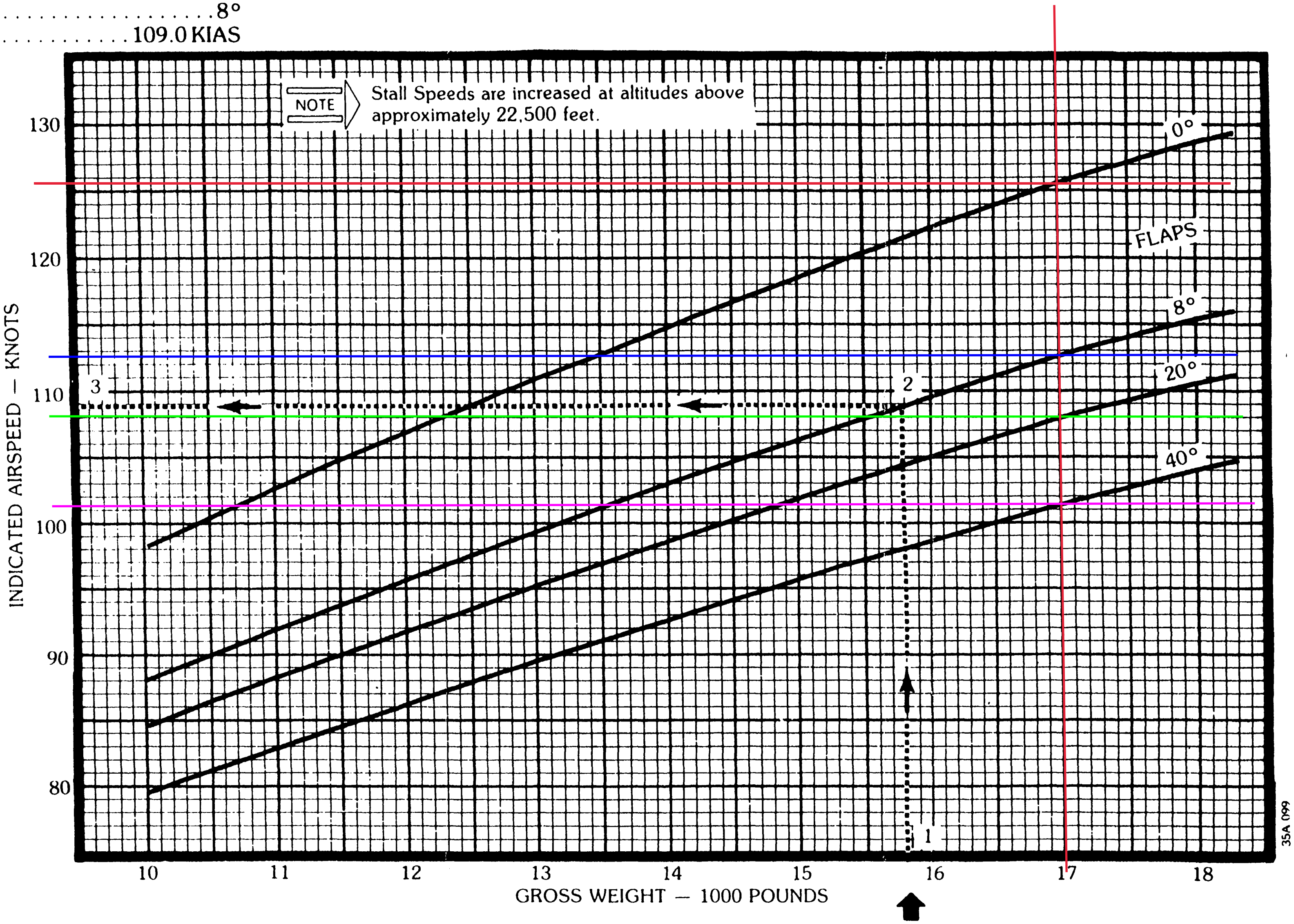


Figure 5-11

EXAMPLE:

1. Bank Angle . . . . 30°
2. Weight . . . . 16000 LBS
3. Flaps . . . . 20°
4. Stall Speed . . . . 113.0 KIAS

STALL SPEEDS – TURNING FLIGHT GEAR UP or DN LEVEL COORDINATED TURN

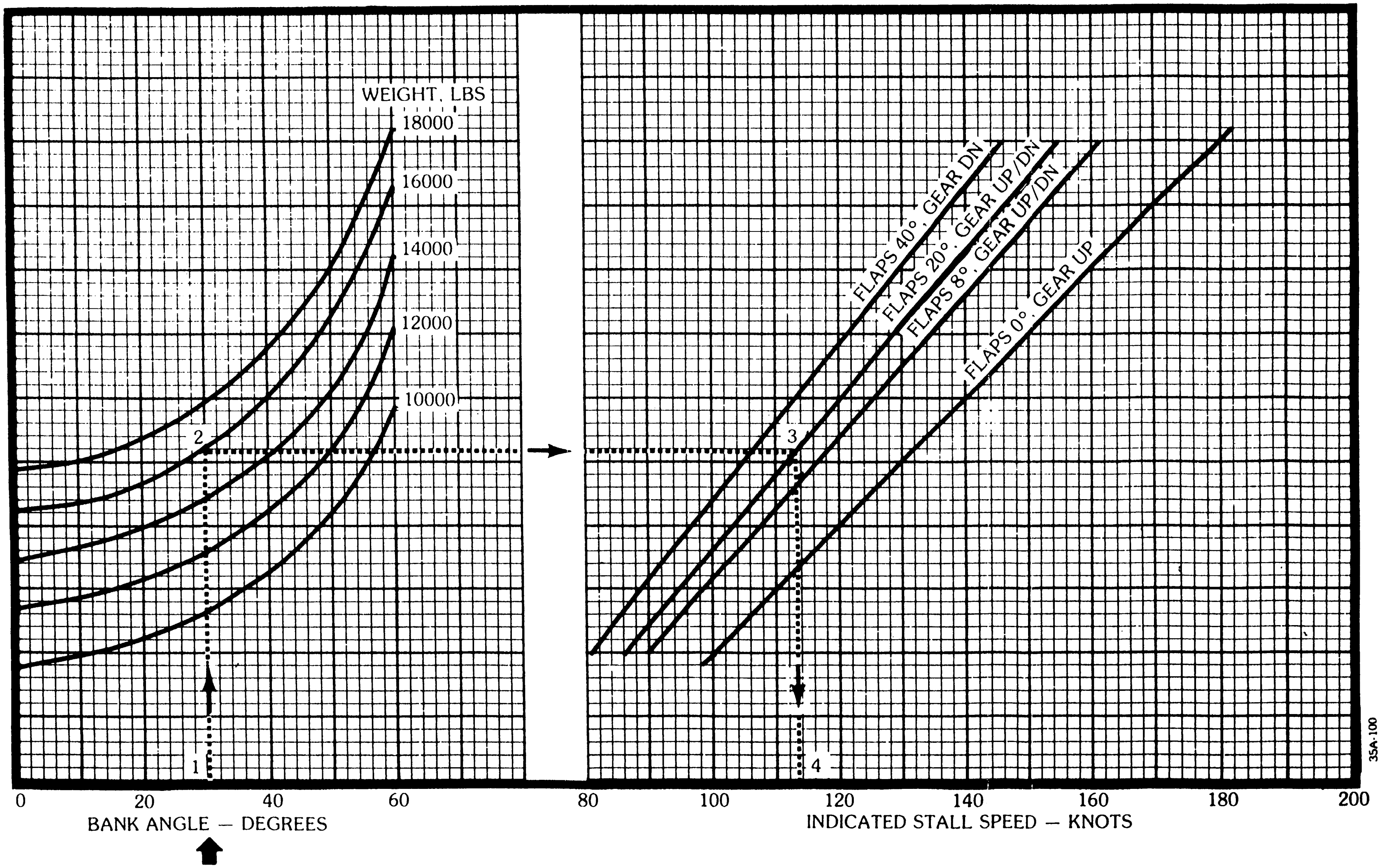
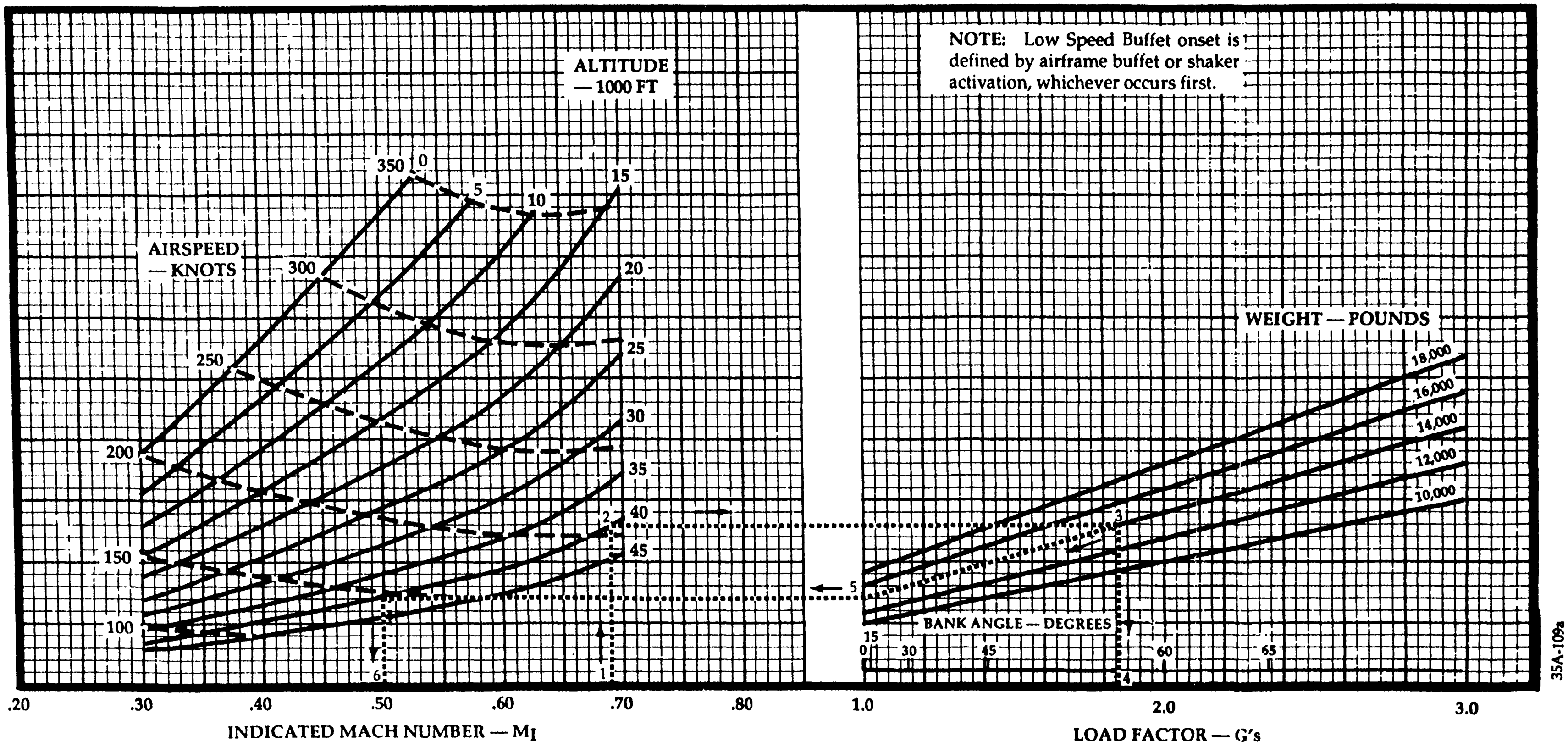


Figure 5-12

LOW SPEED BUFFET BOUNDARY

EXAMPLE:
1. Indicated Mach .... 0.69M_I
2. Altitude .... 40,000 FT
3. Weight .... 14,000 LB
4. Buffet-Free Maneuvering
   Bank Angle = 57°
   Load Factor = 1.85 G
5. For 1 "G" Flight
6. Low Speed Buffet M_I = .50 M_I



NOTE: Low Speed Buffet onset is defined by airframe buffet or shaker activation, whichever occurs first.

Figure 5-13

THRUST SETTING PROCEDURE

TAKEOFF

From the Applicable Takeoff Power Setting Chart of Fan Speed, N_1, vs. Outside Air Temperature, determine the N_1 setting for temperature and altitude. Thrust is set by moving the thrust lever until N_1 indicator aligns with chart value.

NOTE In order to meet the performance shown on the takeoff distance charts and for takeoff power setting technique, refer to TAKEOFF PROCEDURE, this section.

N_1 is the value where the temperature line intersects the pressure altitude line. N_1's above this line may exceed the engine manufacturer's limit. N_1's below this line may not meet the performance in this section.

Operation at a specific N_1 should always be within the Turbine Temperature (ITT) Limits. Turbine Temperature (ITT) Limit must be observed.

PARTIAL POWER TAKEOFF PROCEDURE (OPTIONAL)

Reduced thrust takeoffs are permitted within the parameters outlined in the following information. A takeoff N_1 setting based upon an assumed temperature higher than the existing ambient temperature may be used provided the performance weight limitations equal or exceed actual takeoff weight of the aircraft. Performance weight limitations must be determined at both ambient and assumed temperatures.

NOTE The use of reduced thrust during takeoff is always at the discretion of the pilot.

A reduced thrust takeoff may be used only if:

- the runway surface is hard-paved and dry.
- Bleed Air Anti-ice Systems are OFF.
- the Anti-skid System is ON and operative.
- thrust reduction does not exceed 25 percent of rated takeoff thrust for the existing ambient conditions.
- a full rated-thrust takeoff has been accomplished within the preceding 30 days to assure that no engine deterioration has occurred.

THRUST SETTING PROCEDURE (CONT)

When planning for a PARTIAL POWER TAKEOFF, the following procedure should be used:

1. From the applicable TAKEOFF WEIGHT LIMIT chart, determine the maximum takeoff weight permitted for existing field and ambient conditions.
2. Using the actual aircraft weight, from the applicable TAKEOFF DISTANCE chart, determine the required runway length for existing field and ambient conditions.
3. If the weight from Step 1 is greater than actual takeoff weight, and the distance from Step 2 is less than actual runway length, a reduced thrust takeoff is permitted.
4. Determine the highest ambient temperature at which the actual takeoff weight is permitted by using the actual runway length and working in reverse from the applicable TAKEOFF DISTANCE chart.
5. From the applicable TAKEOFF WEIGHT LIMIT chart, determine the allowable takeoff weight using the temperature obtained from Step 4.
6. Ensure that the allowable takeoff weight determined in Step 5 is equal to or greater than the actual aircraft takeoff weight. Use the temperature obtained in Step 4 as the assumed temperature for remaining calculations.
7. Using the assumed temperature and existing ambient temperature, determine the reduced power takeoff setting from the PARTIAL POWER TAKEOFF N_1 SETTING chart.
8. Using existing ambient temperature and field pressure altitude, determine the maximum takeoff power setting from the applicable TAKEOFF POWER SETTING chart.

NOTE The reduced N_1 setting may not be greater than the maximum N_1 setting for existing ambient conditions.

9. Subtract 7.7% from the N_1 setting obtained in Step 8. Use the greater of the settings determined between this step and Step 7 as the reduced thrust N_1 setting.

NOTE In no case may the N_1 reduction exceed 7.7% rpm. This ensures that the thrust at the reduced setting will be at least 75 percent of the rated takeoff thrust for the existing ambient conditions.

THRUST SETTING PROCEDURE (CONT)

10. Using the assumed temperature and existing field and aircraft conditions, determine V1 using the applicable CRITICAL ENGINE FAILURE SPEED (V1) chart.

NOTE

The purpose of the above calculation is to permit takeoff performance with one engine inoperative and the operative engine at the reduced thrust setting.

CAUTION

If full-thrust is applied, increased yaw must be anticipated.

11. Using the assumed temperature, check obstacle clearance requirements.
12. Complete flight planning using normal procedures.

CLIMB PROCEDURE

MAXIMUM CLIMB

From the applicable Maximum Continuous Thrust (N1) table, determine the Fan Speed (N1) setting for estimated temperature and altitude at the start of the climb. Adjust Fan Speed (N1) for temperature and altitude during climb. Turbine Temperature (ITT) Limit must be observed.

ALTERNATE CLIMB POWER MANAGEMENT PROCEDURE

An alternate climb power management procedure may be employed for climb above 15,000 feet. This is accomplished by setting the required Fan Speed (N1) at 15,000 feet and observing the resulting Turbine Temperature (ITT). This Turbine Temperature (ITT) setting may be used for duration of the climb and will result in Fan Speed (N1) values close to the chart values.

NOTE

A slightly different Fan Speed (N1) Turbine Temperature (ITT) relationship may exist between engines; however, each engine should be operated at the Turbine Temperature which provided the required N1 at 15,000 feet.

THRUST SETTING PROCEDURE (CONT)

CLIMB POWER MANAGEMENT PROCEDURE FOR ANTI-ICE OPERATION

A climb power management procedure for anti-ice operation during climb may be accomplished. Using the applicable Maximum Continuous Thrust (N_1) table, determine the recommended Full Anti-ice On Fan Speed (N_1) for the estimated temperature and altitude. Prior to reducing power and selecting anti-ice, note the ITT. Select anti-ice on and reset power to determined anti-ice on N_1 value. If the resulting ITT is higher than the noted anti-ice off ITT, maintain the full anti-ice on N_1 adjusting for ambient temperature and altitude during climb. Operation should always be within the ITT limits. If the resulting ITT is lower than the noted anti-ice off ITT, N_1 can then be reset up to the noted anti-ice off ITT.

TAKEOFF POWER SETTING
ANTI-ICE – OFF
STANDARD NOZZLE

EXAMPLE:

1. Temperature .... 66°F
2. Altitude .... 4000 FT
3. Takeoff Power Setting .... 97.5% N_1

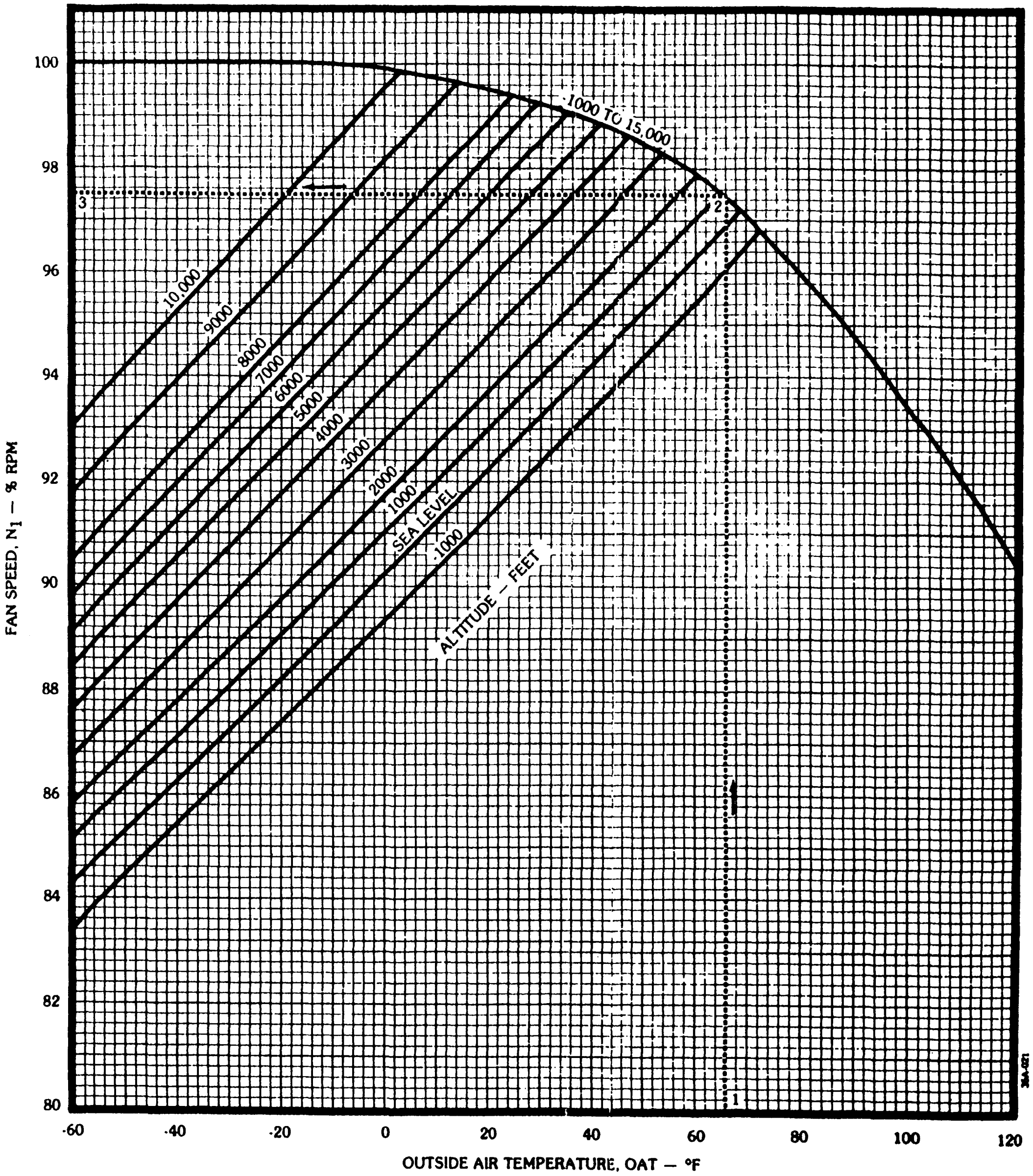


Figure 5-14

EXAMPLE:

1. Temperature .... 30°F
2. Altitude .... 8000 FT
3. Takeoff Power Setting .... 99.0% N_1

TAKEOFF POWER SETTING
NACELLE HEAT ONLY
STANDARD NOZZLE

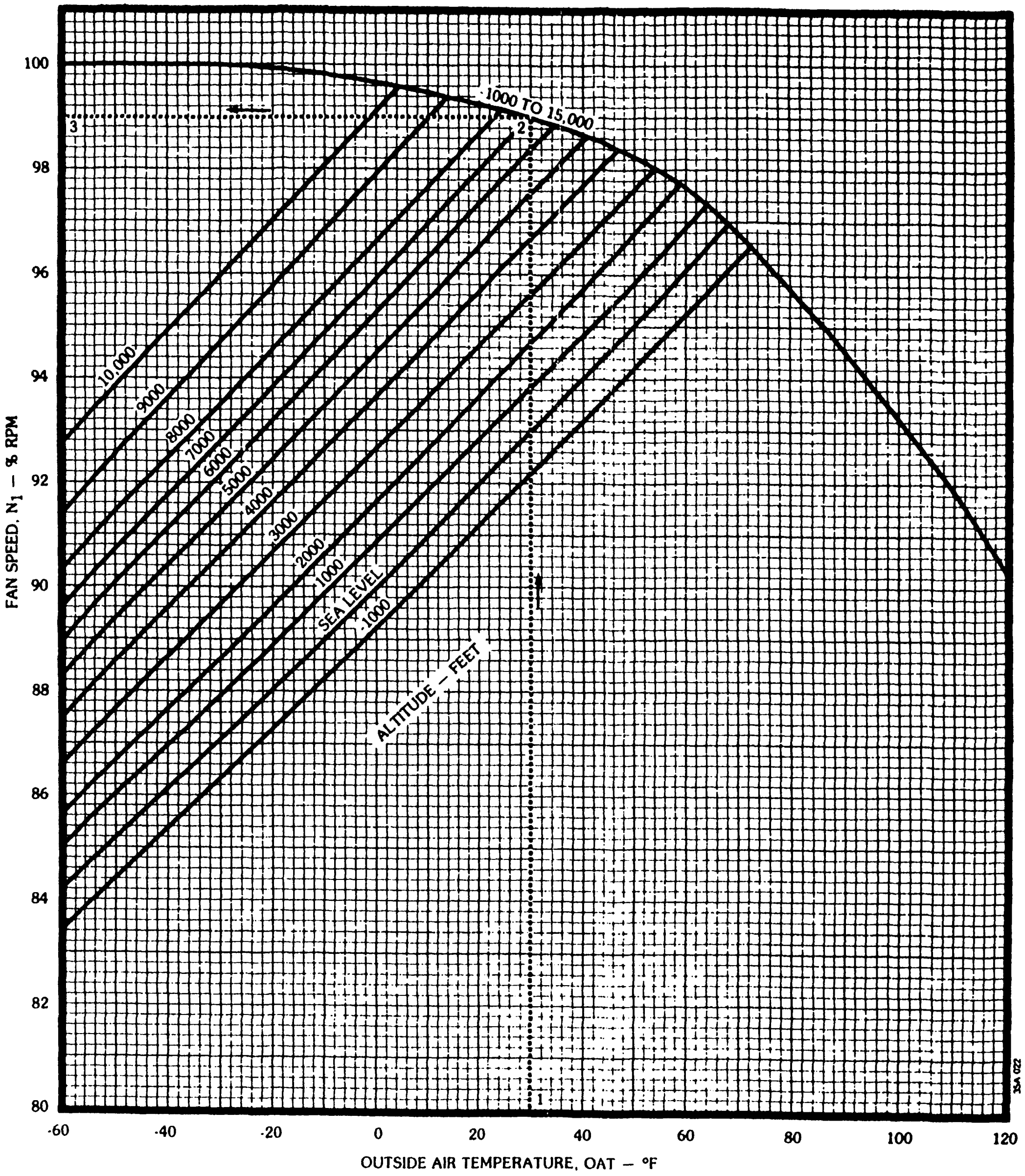


Figure 5-15

EXAMPLE:

1. Temperature .... 0°F
2. Altitude .... 4000 FT
3. Takeoff Power Setting .... 91.2% N_1

TAKEOFF POWER SETTING
FULL ANTI-ICE
STANDARD NOZZLE

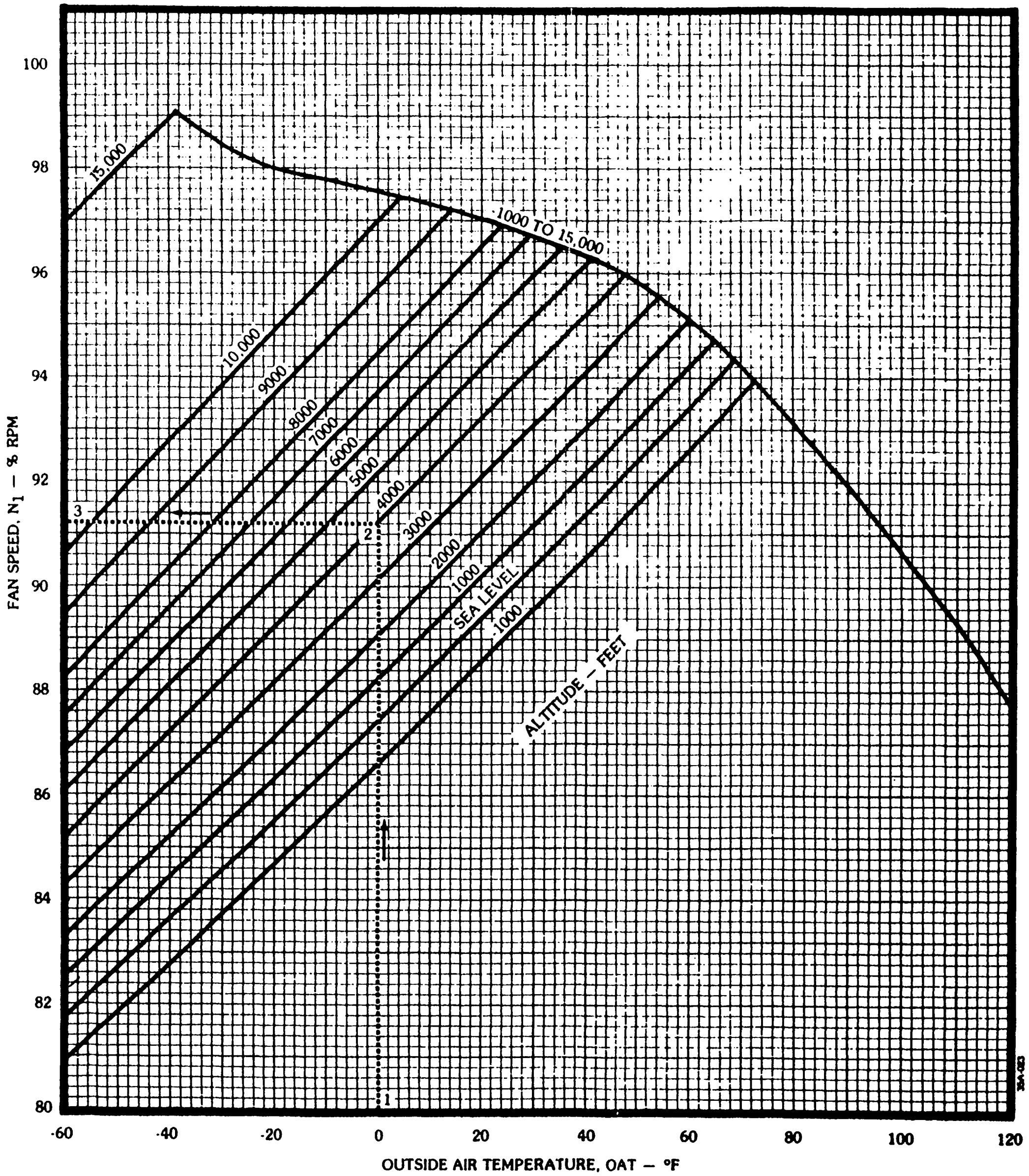


Figure 5-16

EXAMPLE:

1. Assumed Temperature . . . . 82°F
2. Ambient Temperature . . . . 50°F
3. Reduced Thrust Setting . . . . 93.2% N_1

PARTIAL POWER TAKEOFF N_1 SETTING STANDARD NOZZLE

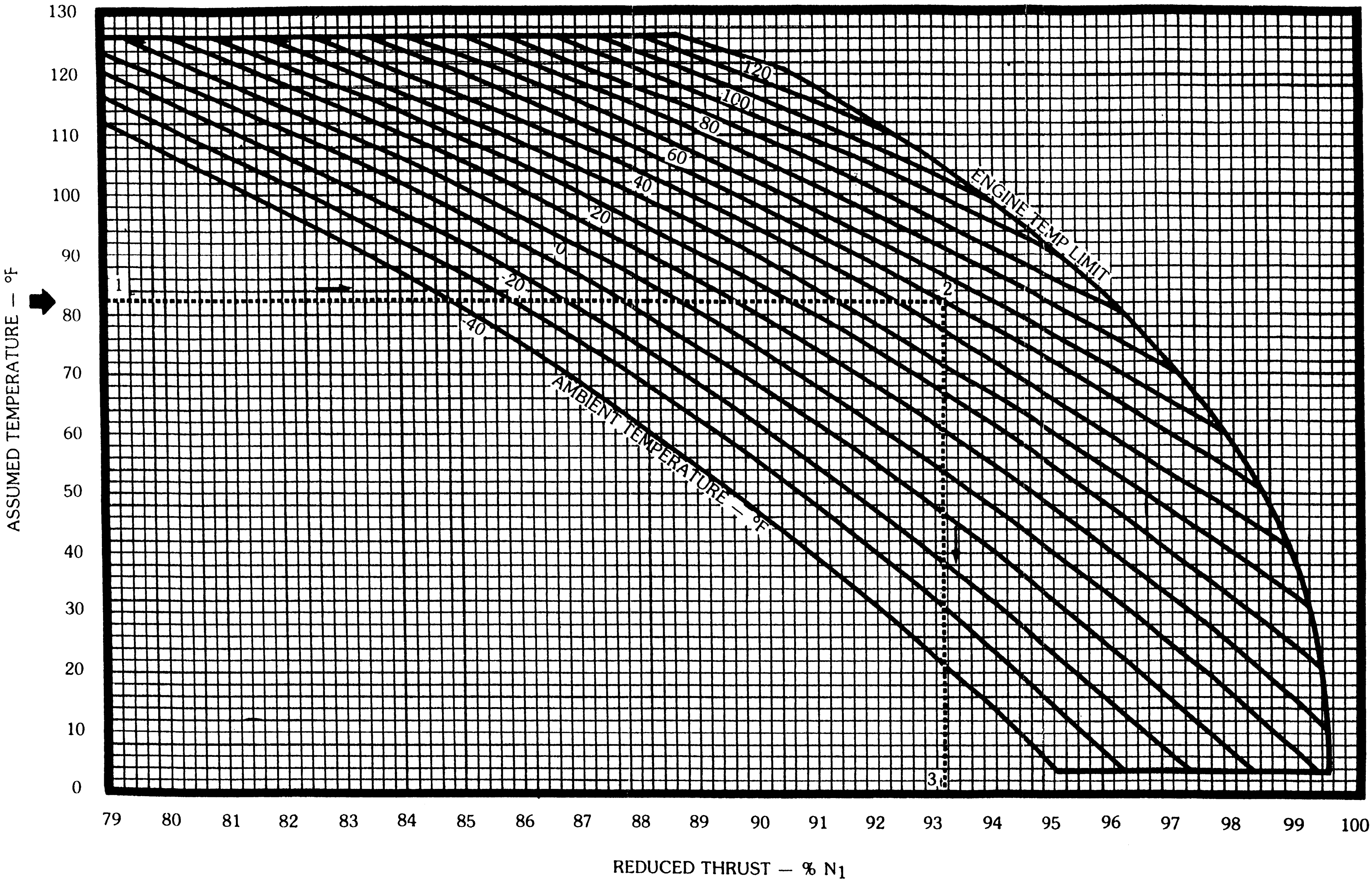


Figure 5-17

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Figure 5-18

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Figure 5-19

MAXIMUM CONTINUOUS THRUST FOR CLIMB (N_1)
ALL ENGINE
STANDARD NOZZLE

RAM AIR TEMPERATURE — °C	ALTITUDE — 1000 FEET									
	S.L.	5	10	15	20	25	30	35	40	45
45	**91.2** 88.0	**91.6** 88.6	**92.1** 89.1							
40	**92.4** 89.1	**92.8** 89.6	**93.1** 90.1							
35	**93.5** 90.2	**93.8** 90.7	**94.1** 91.1	**94.4** 91.5						
30	**94.4** 91.2	**94.7** 91.7	**94.9** 92.0	**95.1** 92.4						
25	**95.3** 92.1	**95.5** 92.5	**95.6** 92.8	**95.7** 93.1	**95.6** 93.4					
20	**95.6** 92.8	**96.1** 93.2	**96.2** 93.4	**96.3** 93.7	**96.2** 93.9					
15	**94.8** 92.5	**96.6** 93.8	**96.7** 94.0	**96.7** 94.2	**96.6** 94.4	**96.6** 94.4				
10	**93.9** 91.6	**97.1** 94.2	**97.1** 94.4	**97.1** 94.6	**97.0** 94.7	**97.0** 94.7	**96.6** 94.6			
5	**93.0** 90.7	**96.5** 94.5	**97.4** 94.8	**97.4** 94.9	**97.3** 95.0	**97.3** 95.0	**97.0** 94.8	**96.3** 94.3		
0	**92.2** 89.8	**95.7** 93.6	**97.6** 95.1	**97.6** 95.2	**97.5** 95.2	**97.5** 95.2	**97.3** 95.0	**96.6** 94.6	**94.7** 93.4	
-5	**91.3** 89.0	**94.7** 92.7	**97.8** 95.3	**97.8** 95.4	**97.7** 95.4	**97.7** 95.4	**97.5** 95.2	**97.0** 94.8	**95.2** 93.7	**93.1** 92.3
-10	**90.4** 88.1	**93.8** 91.8	**97.5** 95.5	**97.9** 95.5	**97.9** 95.5	**97.8** 95.5	**97.8** 95.3	**97.2** 95.0	**95.6** 94.1	**93.7** 92.8
-15	**89.5** 87.2	**93.0** 91.0	**96.6** 94.5	**98.1** 95.6	**98.0** 95.6	**98.0** 95.6	**97.8** 95.5	**97.4** 95.2	**96.0** 94.3	**94.2** 93.1
-20	**88.6** 86.3	**92.1** 90.0	**95.7** 93.6	**98.3** 95.7	**98.2** 95.7	**98.2** 95.7	**98.0** 95.6	**97.7** 95.3	**96.4** 94.5	**94.7** 93.4
-25	**87.8** 85.5	**91.2** 89.1	**94.7** 92.7	**98.6** 95.8	**98.5** 95.8	**98.5** 95.8	**98.3** 95.7	**97.9** 95.4	**96.7** 94.7	**95.1** 93.6
-30	**87.0** 84.6	**90.3** 88.2	**93.8** 91.8	**98.4** 95.7	**98.8** 95.9	**98.8** 95.9	**98.6** 95.8	**98.3** 95.5	**97.1** 94.9	**95.5** 93.8
-35	**86.1** 83.8	**89.4** 87.4	**92.9** 90.9	**97.5** 94.8	**99.3** 96.1	**99.3** 96.1	**99.1** 95.9	**98.7** 95.7	**97.6** 95.0	**95.9** 94.0
-40	**85.2** 83.0	**88.5** 86.5	**91.9** 90.0	**96.5** 94.0	**99.8** 96.3	**99.8** 96.3	**99.6** 96.2	**99.3** 95.9	**98.1** 95.2	**96.4** 94.2

35A-026

XX.X ANTI-ICE OFF or NACELLE HEAT ONLY
XX.X FULL ANTI-ICE ON

SPEED SCHEDULE
- 250 KIAS to 32,000 ft
- 0.7 MI to 45,000 ft

Figure 5-20

MAXIMUM CONTINUOUS THRUST FOR CLIMB (N1)
SINGLE ENGINE
STANDARD NOZZLE

ALTITUDE — 1000 FEET

RAM AIR TEMPERATURE — °C	S.L.	5	10	15	20	25	30	35	40	45
45	**91.4** 86.8	**91.4** 87.1	**92.0** 87.6							
40	**92.6** 88.0	**92.6** 88.2	**93.1** 88.7							
35	**92.6** 89.1	**92.6** 89.4	**93.0** 89.7	**93.4** 90.1						
30	**93.7** 90.1	**93.7** 90.4	**94.0** 90.7	**94.2** 91.1						
25	**94.7** 91.2	**94.7** 91.4	**94.9** 91.7	**95.0** 92.0						
20	**95.5** 92.1	**95.5** 92.4	**95.6** 92.6	**95.7** 92.8	**95.6** 92.8					
15	**95.4** 92.7	**96.2** 93.2	**96.2** 93.3	**96.3** 93.5	**96.2** 93.5					
10	**94.5** 91.9	**96.8** 93.8	**96.7** 94.0	**96.7** 94.1	**96.7** 94.1	**96.6** 94.1				
5	**93.5** 91.0	**97.2** 94.3	**97.1** 94.4	**97.1** 94.5	**97.1** 94.5	**96.9** 94.5	**96.5** 94.2			
0	**92.6** 90.1	**96.6** 94.3	**97.4** 94.8	**97.4** 94.9	**97.4** 94.9	**97.2** 94.9	**96.8** 94.5	**95.6** 93.6		
-5	**91.7** 89.2	**95.6** 93.4	**97.6** 95.1	**97.6** 95.1	**97.6** 95.1	**97.4** 95.1	**97.1** 94.8	**96.1** 94.0	**94.4** 93.3	
-10	**90.8** 88.4	**94.8** 92.5	**97.8** 95.3	**97.8** 95.4	**97.8** 95.4	**97.6** 95.4	**97.3** 95.0	**96.5** 94.3	**94.9** 93.6	**93.3** 92.5
-15	**89.9** 87.5	**93.8** 91.6	**97.4** 95.2	**98.0** 95.5	**98.0** 95.5	**97.8** 95.5	**97.5** 95.2	**96.8** 94.6	**95.2** 93.8	**93.8** 92.8
-20	**89.1** 86.7	**92.9** 90.7	**96.4** 94.2	**98.1** 95.6	**98.1** 95.6	**97.9** 95.6	**97.7** 95.3	**97.1** 94.8	**95.6** 94.0	**94.3** 93.1
-25	**88.2** 85.8	**92.0** 89.8	**95.5** 93.3	**98.3** 95.6	**98.3** 95.6	**98.2** 95.6	**98.0** 95.4	**97.3** 94.9	**96.0** 94.2	**94.8** 93.3
-30	**87.3** 85.0	**91.0** 88.9	**94.5** 92.4	**98.7** 95.8	**98.7** 95.8	**98.5** 95.8	**98.3** 95.5	**97.7** 95.1	**96.4** 94.4	**95.2** 93.6
-35	**86.4** 84.1	**90.1** 88.0	**93.6** 91.4	**99.1** 95.9	**99.1** 95.9	**98.9** 95.9	**98.7** 95.7	**98.1** 95.3	**96.9** 94.5	**95.6** 93.7
-40	**85.6** 83.3	**89.2** 87.1	**92.6** 90.5	**98.5** 95.5	**99.6** 96.2	**99.4** 96.2	**99.2** 95.9	**98.6** 95.5	**97.4** 94.7	**96.1** 93.9

35A-027

XX.X ANTI-ICE OFF or NACELLE HEAT ONLY
XX.X FULL ANTI-ICE ON

SPEED SCHEDULE
- 200 KIAS to 26,700 ft
- 0.5 MI to 33,500 ft
- 170 KIAS to 45,000 ft

Figure 5-21

USE OF TAKEOFF CHARTS

MAXIMUM TAKEOFF WEIGHT

The charts on the following pages present the information necessary to determine the maximum allowable takeoff weight as limited by gross climb performance or brake energy limits. The climb limitations portion of the charts do not specify the limiting climb segment, only that any one or a combination of the takeoff climb segments (first, second or final) are limiting.

Takeoff must be made within the limitations of the maximum takeoff weight, TAKEOFF WEIGHT LIMITS chart, and by the performance determined from the TAKEOFF DISTANCE chart.

Example:

1. Maximum takeoff weight is 17,000, 18,000 or 18,300 pounds.
2. From the applicable TAKEOFF WEIGHT LIMITS chart, determine maximum takeoff weight for airport altitude and temperature.
3. From the applicable TAKEOFF DISTANCE chart, determine the maximum takeoff weight for the runway and ambient conditions.
4. For FAR 121 and 135 as applicable to U.S. registered aircraft, from the applicable TAKEOFF FLIGHT PATH and CLIMB GRADIENT charts, determine the maximum takeoff weight for obstacle clearance.
5. The lowest of the weights from steps 1, 2, 3 and 4 is the heaviest allowable weight at which the airplane can take off.

TAKEOFF DISTANCE CHARTS

The TAKEOFF DISTANCE Charts in this manual are presented for 8° or 20° flap settings and show required field length in terms of altitude, temperature, weight, wind, runway gradient, anti-skid on or off, and anti-ice systems on or off. These charts may be used to determine either of the following:

1. The runway length required given the airplane weight, runway gradient, pressure altitude, temperature, and wind. The example on the applicable chart illustrates determination of runway length required.
2. The maximum airplane takeoff weight corresponding to a specific runway length, runway gradient, pressure altitude, temperature, and wind. Takeoff weight for runway length available may be determined by working through the chart in the opposite manner as finding runway length.

TAKEOFF PROCEDURE

The takeoff distances on the TAKEOFF DISTANCE charts can be realized by following the ENGINE FAILURE DURING TAKEOFF procedure in Section III and using the following technique from a standing start with brakes set:

1. Run engines at 750°C ITT for 15 seconds to stabilize Fan Speed (N_1). Then, set takeoff Fan Speed (N_1).
2. After brake release, continuously adjust Fan Speed (N_1) up to 80 KIAS.
3. - For engine failure above V_1:
     a. Rotate to approximately 9° nose up at V_R.
     b. Accelerate to V_2 then increase pitch as required to maintain V2 through a height of 35 feet.
   - For rejected takeoff (engine failure below V_1):
     a. Braking Techniques:
        - Anti-skid operative — Apply maximum anti-skid braking until the airplane stops.
        - Anti-skid inoperative — Apply brakes judiciously to prevent tire skid or failure. Modulating brake pressures will improve feel and reduce the probability of tire skid.

USE OF TAKEOFF CHARTS (CONT)

CALCULATION OF CORRECTION FOR RUNWAYS WITH A GRADIENT GREATER THAN 2.0% AND LESS THAN OR EQUAL TO 2.4%

The information provided here is used to calculate takeoff corrections for dry conditions with runway gradients >2.0% and ≤2.4%.

DOWNHILL (NEGATIVE) GRADIENT

Takeoff Weight Limit
It is not necessary to make corrections to the Takeoff Weight Limit for runways with a downhill gradient.

Takeoff Distance
Determine Takeoff Distance using the appropriate chart in this section and assume runway has a -2.0% gradient. Additional correction is not required.

Critical Engine Failure Speed
Determine Critical Engine Failure Speed (V1) using the appropriate chart in this section and assume runway has a -2.0% gradient. Additional correction is not required.

UPHILL (POSITIVE) GRADIENT

Takeoff Weight Limit
Determine Climb Weight Limit using the appropriate chart in this section. Adjust the Climb Weight Limit by subtracting the appropriate weight from the table below.

Takeoff Weight Limit	
Uphill Gradient	**Climb Weight Correction**
+2.1%	Subtract 125 pounds (56.7 kg)
+2.2%	Subtract 250 pounds (113.4 kg)
+2.3%	Subtract 375 pounds (170.1 kg)
+2.4%	Subtract 500 pounds (226.8 kg)

Determine the Brake Energy Weight Limit using the appropriate chart in this section. Additional correction is not required.

Takeoff Distance
Determine Takeoff Distance using the appropriate chart in this section. Correct for wind and runway gradient assuming a +2.0% gradient. Stop and multiply the Takeoff Distance by 1.03. Continue across the chart with the corrected value making corrections for Anti-Skid, Anti-Ice, and Altitude as needed. Refer to the example on the following page.

Critical Engine Failure Speed
Determine Critical Engine Failure Speed (V1) using the appropriate chart in this section and assume runway has a +2.0% gradient. Adjust the Critical Engine Failure Speed (V1) by adding 1 knot.

Example:
(For runways with positive [uphill] gradient)

1. Value obtained from Takeoff Distance chart given the Altitude/Temperature and Gross Weight
2. Headwind .... 20 kt
3. Runway Gradient Reference Line
4. Runway Gradient .... 2.2% UP
5. Takeoff Field Length Corrected for Wind and 2.0% Gradient .... 7,300 ft
   Answer from Step 5 Multiplied by 1.03 .... 7,519 ft
6. Anti-Skid System Reference Line .... enter at 7,519 ft
7. Anti-Skid System .... ON
8. Anti-Ice System Reference Line
9. Anti-Ice System .... OFF
10. Altitude Reference Line
11. Altitude .... 8,000 ft
12. Corrected Takeoff Field Length .... 7,519 ft

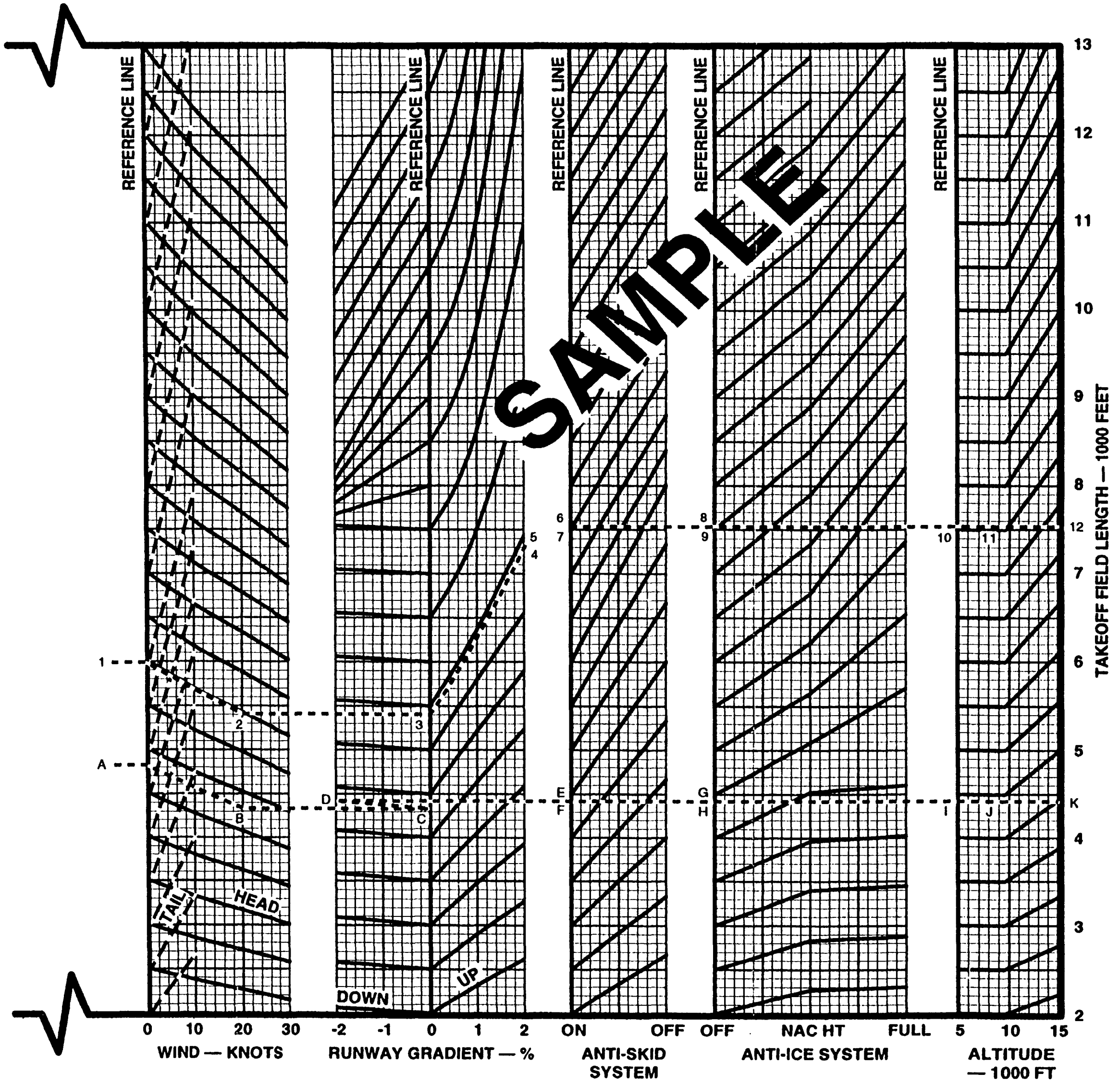
Example:
(For runways with negative [downhill] gradient)

A. Value obtained from Takeoff Distance chart given the Altitude/Temperature and Gross Weight
B. Headwind .... 20 kt
C. Runway Gradient Reference Line
D. Runway Gradient .... -2.2% DOWN

NOTE: Use -2.0% for all gradients >2.0% and ≤2.4%.

E. Anti-Skid System Reference Line
F. Anti-Skid System .... ON
G. Anti-Ice System Reference Line
H. Anti-Ice System .... OFF
I. Altitude Reference Line
J. Altitude .... 8,000 ft
K. Corrected Takeoff Field Length .... 4,400 ft

CALCULATION OF CORRECTION FOR RUNWAYS WITH A GRADIENT GREATER THAN 2.0% AND LESS THAN OR EQUAL TO 2.4% (Cont)



USE OF TAKEOFF CHARTS (CONT)

TAKEOFF FLIGHT PATH CHARTS

The takeoff flight path is divided into segments defined by changes in the airplane configuration. The terms used in flight path plotting are defined as follows and illustrated on the TAKEOFF PROFILE figure.

Reference Zero	A point 35 feet above the runway surface at the final point of the takeoff run (takeoff distance).
First Segment	Segment extending from the 35-foot height at the end of the takeoff run (Reference Zero) to the height at the end of gear retraction.
NOTE	The First Segment of the Takeoff Flight Path represents only a portion of the First Segment Climb as shown on the TAKEOFF PROFILE figure.
Second Segment	Segment beginning at the end of gear retraction (end of first segment) and continuing to a height of 1500 feet above the runway at V_2 speed. It is noted that in the TAKEOFF PROFILE figure, the second segment is shown only to a height of 400 feet. However, this is a **minimum** requirement, and for simplified flight planning the Takeoff Flight Path Charts in this manual present the second segment required gradients to the 1500-foot point for obstacle clearance considerations.
Effect of Wind on Flight Path	The effect of wind is to increase or decrease the apparent climb gradients or horizontal distances on each segment of the flight path.

The TAKEOFF FLIGHT PATH Charts presented in this manual are separated into CLOSE-IN and DISTANT flight paths for 8° and 20° flap settings. The CLOSE-IN TAKEOFF FLIGHT PATH Charts facilitate determination of required gradients within approximately two miles horizontal distance from Reference Zero. The DISTANT TAKEOFF FLIGHT PATH CHARTS facilitate determination of required gradients to nearly eight miles from Reference Zero.

On these charts each flight path line is marked with numbers showing the net climb gradients required for obstacle clearance at the end of the first and second segment climb. The origin of each line is Reference Zero, and the slope of the line segments (scale vertical distance divided by scale horizontal distance) are the slopes of the required climb segments in space in zero wind conditions. Since the zero wind first and second segment climbs are uniquely related to each other for each airplane weight and environment, it can be seen that the actual flight path in still air can be obtained from the TAKEOFF FLIGHT PATH Charts by knowing only one of the applicable gradients.

USE OF TAKEOFF CHARTS (CONT)

CLIMB GRADIENT CHARTS

Climb performance charts for 8° and 20° flap settings are presented in terms of altitude, temperature, weight, wind, and anti-ice systems on or off. The gradients for First, Second, and Final Segments are read at the temperature and pressure altitude for the departure airport and are the net gradients that will be achieved at the appropriate segment of the Takeoff Flight Path; e.g., for departure from an airport pressure altitude of 2000 feet the gradients read from the charts will be the gradients achieved at 2000 feet, 2400 feet, and 3500 feet for First, Second, and Final Segments respectively.

These charts show the net gradients available and are to be used with the TAKEOFF FLIGHT PATH Charts which show the required net gradients when flight planning for obstacle clearance.

DETERMINATION OF TAKEOFF FLIGHT PATH FOR OBSTACLE CLEARANCE

The weight used for the following determination is defined as the airplane weight at the beginning of the takeoff roll. Using this weight for each climb segment will result in some small conservatism, since the gradients are presented in terms of instantaneous gross weight rather than the weight at the beginning of takeoff roll.

When flight path planning for obstacle clearance is desired, the following procedure may be used:

1. From the applicable TAKEOFF WEIGHT LIMITS Chart, determine the highest weight at which a takeoff may be made for the local temperature and pressure altitude.
2. From the applicable TAKEOFF DISTANCE Chart, determine the highest weight at which a takeoff may be made using the runway gradient, appropriate wind component, field pressure altitude, and local temperature. The lower of this weight and the weight from the TAKEOFF WEIGHT LIMITS Chart is the first trial takeoff gross weight.
3. Determine the horizontal distance of the obstacle from reference zero.
4. From the applicable TAKEOFF FLIGHT PATH Chart, for the first or second segment, depending on where the critical obstacle is considered to be, determine the required climb gradient for obstacle clearance (zero wind gradient).

USE OF TAKEOFF CHARTS (CONT)

DETERMINATION OF TAKEOFF FLIGHT PATH FOR OBSTACLE CLEARANCE (CONT)

5. From the applicable CLIMB GRADIENT Chart, determine the aircraft climb gradient performance.

NOTE It is noted at this point that a head wind serves to increase climb gradient performance, whereas a tail wind decreases climb gradient performance.

6. •If step 5 (climb gradient performance) is more than step 4 (required gradient), obstacle clearance is satisfactory.

   •If step 5 (climb gradient performance) is less than step 4 (required gradient), obstacle clearance is unsatisfactory and procedures must be repeated using a lesser weight. When weight is reduced to achieve obstacle clearance, note that the horizontal distance between the obstacle and reference zero increases, since the takeoff field length is less. Consequently an interpolative process is required to find the exact minimum gradient and maximum weight for obstacle clearance.

TAKEOFF PROFILE

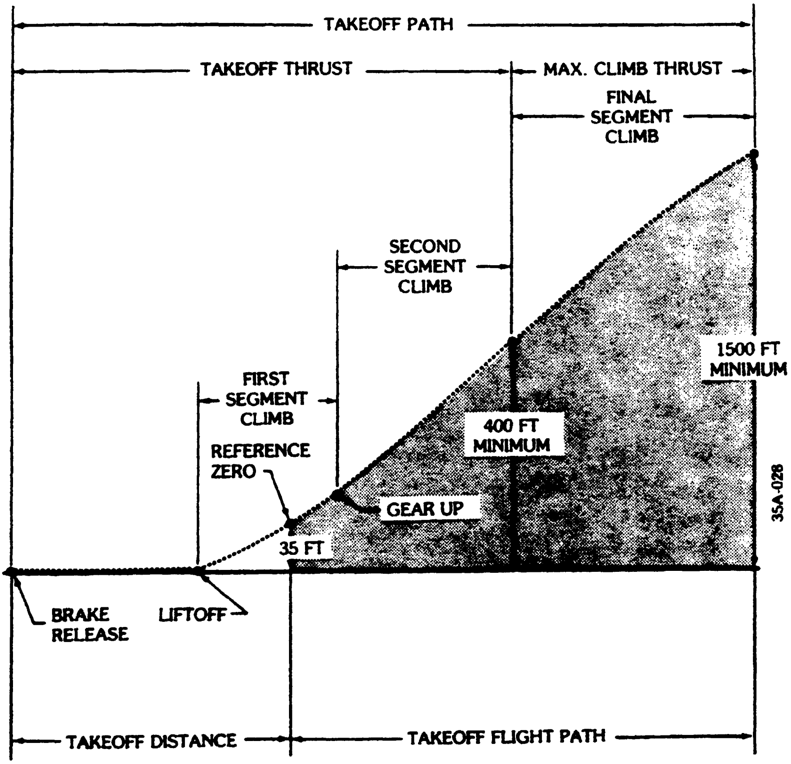

TAKEOFF PATH
TAKEOFF THRUST
MAX. CLIMB THRUST
FINAL SEGMENT CLIMB
SECOND SEGMENT CLIMB
FIRST SEGMENT CLIMB
REFERENCE ZERO
GEAR UP
400 FT MINIMUM
1500 FT MINIMUM
35 FT
BRAKE RELEASE
LIFTOFF
TAKEOFF DISTANCE
TAKEOFF FLIGHT PATH
35A-028

Figure 5-22

TAKEOFF WEIGHT LIMIT
FLAPS 8° ANTI-ICE — OFF

EXAMPLE:

1. Temperature .... 50°F
2. Altitude .... 10,000 ft
3. Takeoff Climb Weight Limit ......17,850 lb
4. Wind Reference Line
5. Headwind...................... 20 kt
6. Brake Energy Weight Limit ......18,250 lb

The most limiting condition is takeoff climb.

- Takeoff Weight Limit...........17,850 lb

NOTE: THE VALUE OBTAINED FROM THIS CHART MAY NOT BE THE LIMITING WEIGHT. TAKEOFF WEIGHT IS ALSO LIMITED BY THE MAXIMUM CERTIFIED TAKEOFF WEIGHT AND THE TAKEOFF WEIGHT FOR THE RUNWAY LENGTH AVAILABLE.

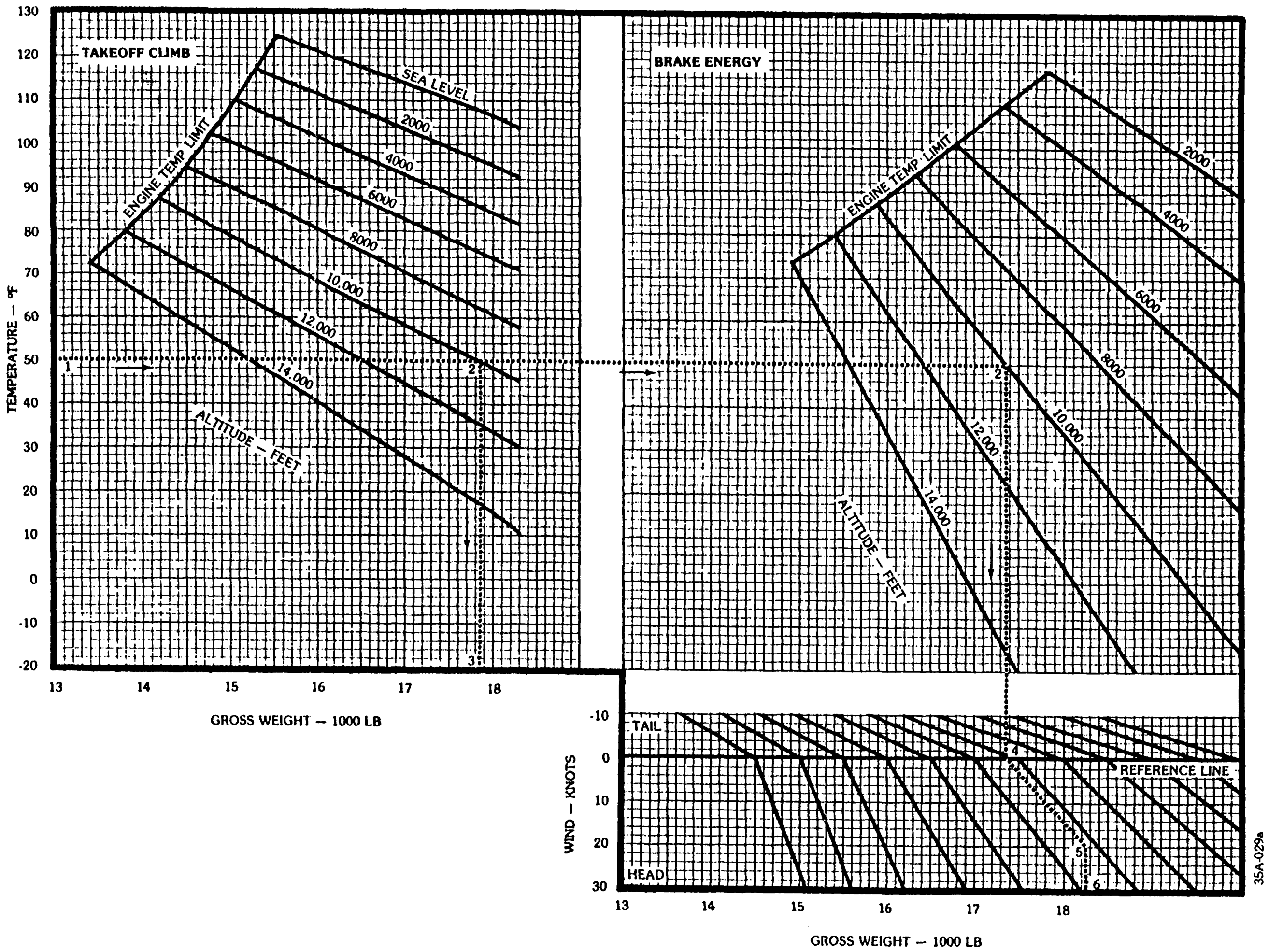
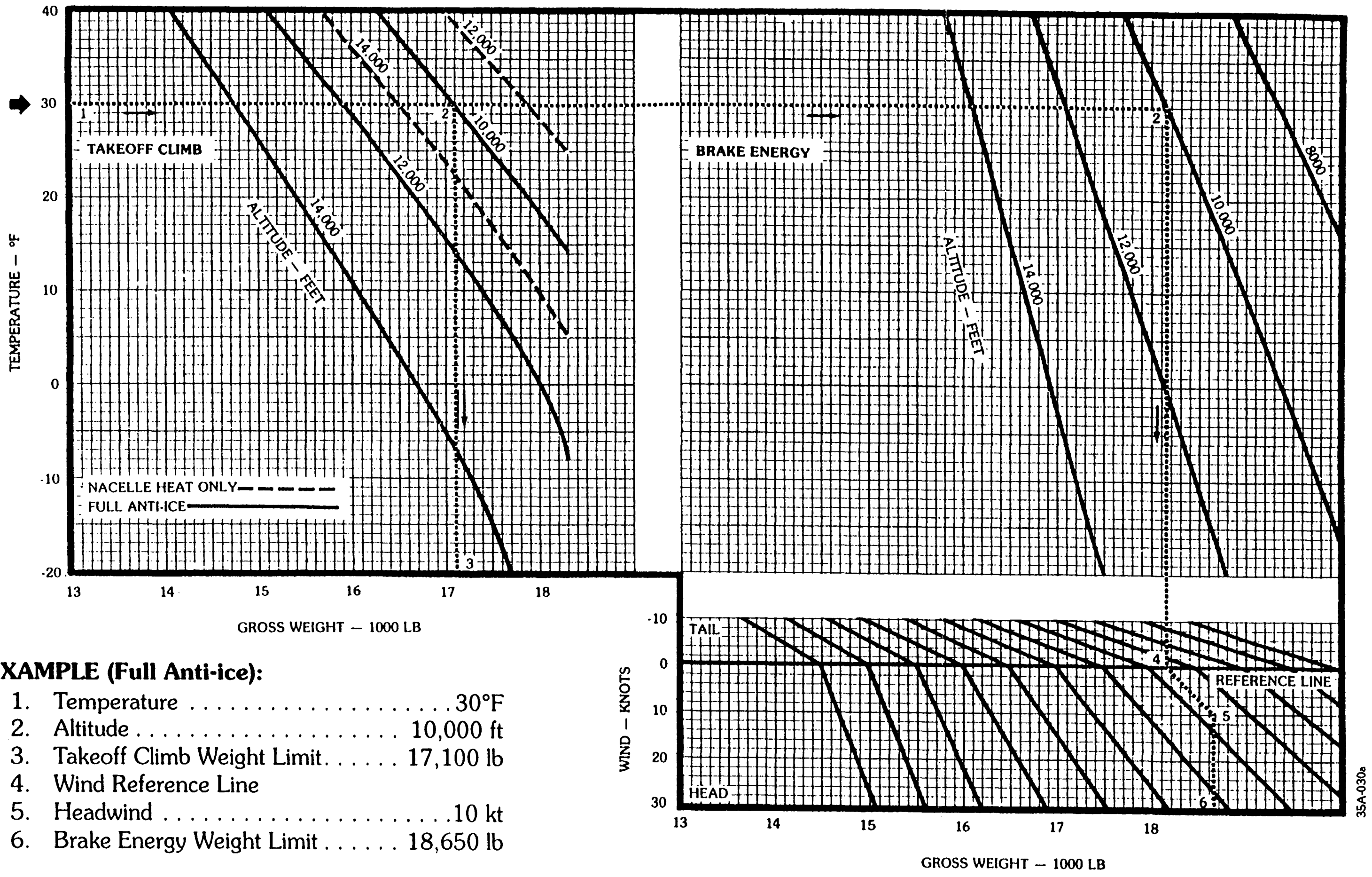


Figure 5-23

TAKEOFF WEIGHT LIMIT
FLAPS 8° ANTI-ICE — ON



EXAMPLE (Full Anti-ice):

1. Temperature .... 30°F
2. Altitude .... 10,000 ft
3. Takeoff Climb Weight Limit...... 17,100 lb
4. Wind Reference Line
5. Headwind .... 10 kt
6. Brake Energy Weight Limit ...... 18,650 lb

The most limiting condition is takeoff climb.

- Takeoff Weight Limit .... 17,100 lb

NOTE: THE VALUE OBTAINED FROM THIS CHART MAY NOT BE THE LIMITING WEIGHT. TAKEOFF WEIGHT IS ALSO LIMITED BY THE MAXIMUM CERTIFIED TAKEOFF WEIGHT AND THE TAKEOFF WEIGHT FOR THE RUNWAY LENGTH AVAILABLE.

Figure 5-24

TAKEOFF DISTANCE
TAKEOFF WEIGHT
FLAPS 8°

EXAMPLE (Takeoff Distance):

1. Temperature . . . . 50°F
2. Altitude . . . . 4000 FT
3. Weight Ref. Line
4. Weight . . . . 16,000 LB
5. Wind Ref. Line
6. Headwind . . . . 20 KTS
7. Runway Gradient Ref. Line
8. Runway Gradient . . . 1% UP
9. Anti-skid Ref. Line
10. Anti-skid . . . . ON
11. Anti-ice Ref. Line
12. Anti-ice . . . . OFF
13. Altitude Ref. Line
14. Altitude . . . . 4000 FT
15. Takeoff Field Length 4270 FT

EXAMPLE (Takeoff Weight):

A. Takeoff Field Length . 7000 FT
B. Altitude . . . . 4000 FT
C. Altitude Ref. Line
D. Anti-ice . . . . OFF
E. Anti-ice Ref. Line
F. Anti-skid . . . . ON
G. Anti-skid Ref. Line
H. Runway Gradient . . . .9% UP
I. Runway Gradient Ref. Line
J. Headwind . . . . 20 KTS
K. Wind Ref. Line
L. Temperature . . . . 80°F
M. Altitude . . . . 4000 FT
N. Weight Ref. Line
O. Intersection Point
P. Takeoff Weight . . . 17,100 LB

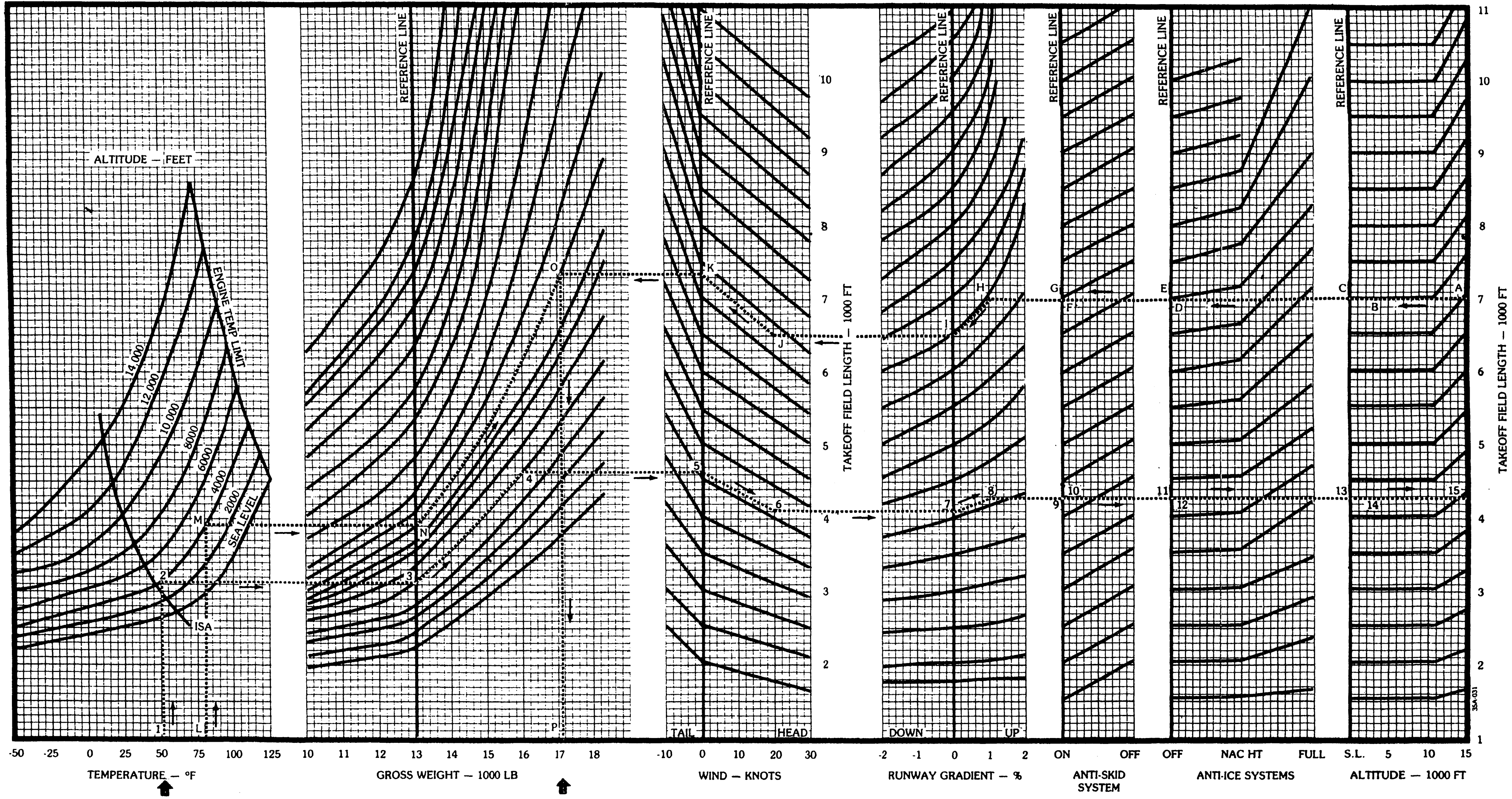


Figure 5-25

CRITICAL ENGINE FAILURE SPEED (V_1) FLAPS – 8°

XAMPLE:

1. Temperature .... 50°F
2. Altitude .... 6000 FT
3. Weight Ref. Line
4. Weight .... 15,000 LB
5. Wind Ref. Line
6. Tailwind .... 10 KTS
7. Runway Gradient Ref. Line
8. Runway Gradient .... 1% UP
9. Anti-ice Ref. Line
10. Anti-ice .... OFF
11. Anti-skid Ref. Line
12. Anti-skid .... ON
13. Critical Engine Failure Speed .... 119 KIAS

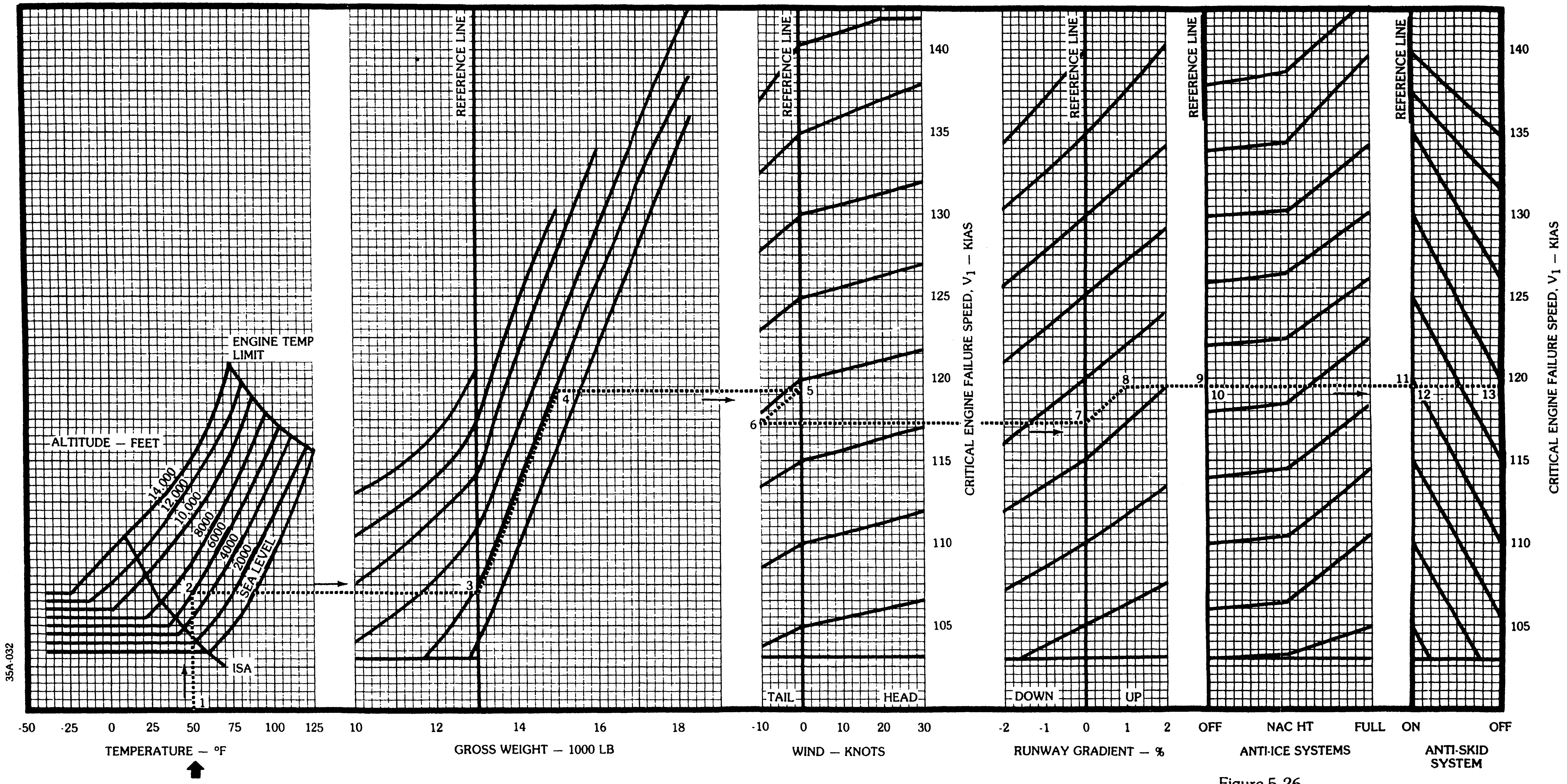


Figure 5-26

ROTATION SPEED (V_R) FLAPS – 8°

EXAMPLE:

1. Weight . . . . 15,000 LB
2. Rotation Speed . . . . 130.0 KIAS

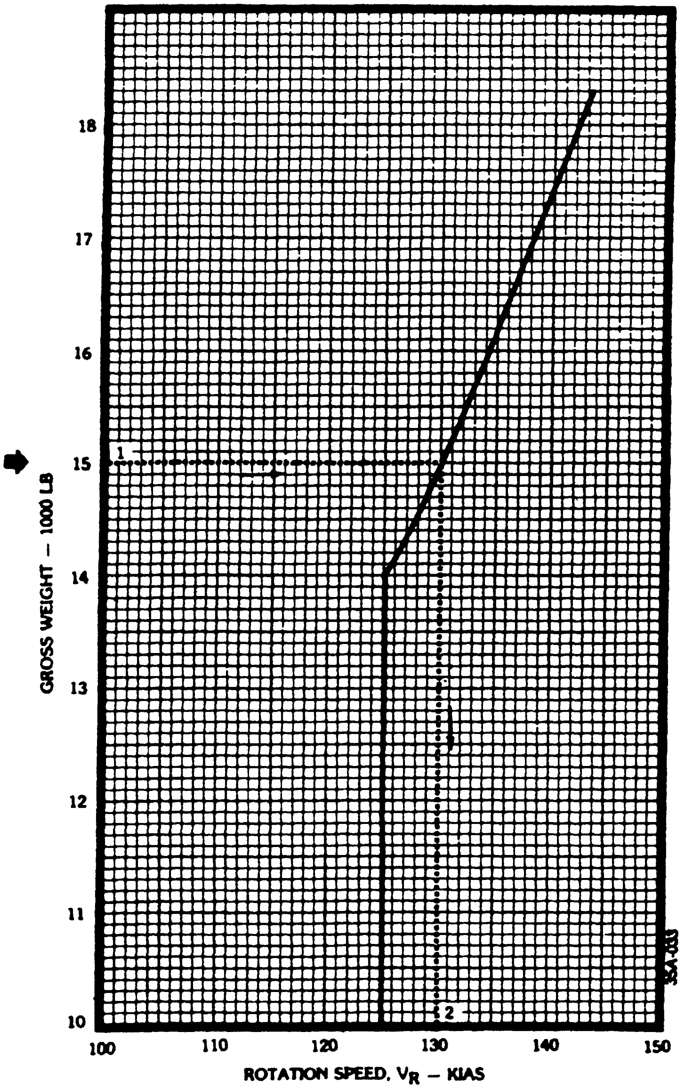


Figure 5-27

TAKEOFF SAFETY SPEED (V_2) FLAPS – 8°

EXAMPLE:

1. Weight .... 15,100 LB
2. Engine Out Safety Speed .... 133.0 KIAS

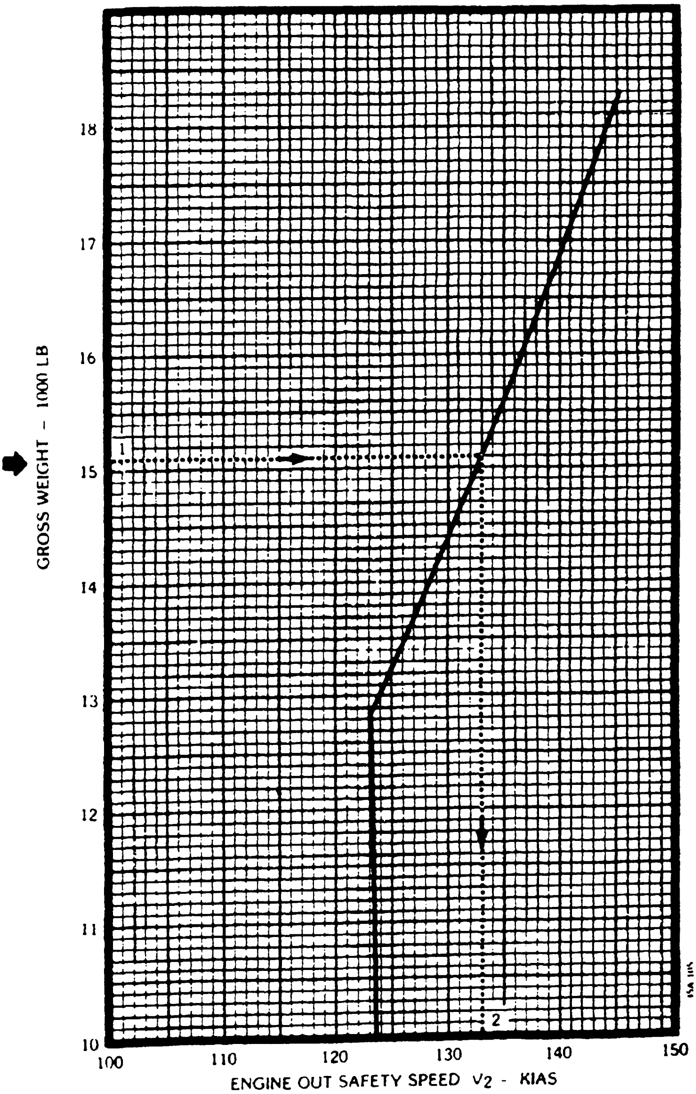


Figure 5-28

CLOSE IN TAKEOFF FLIGHT PATH
FLAPS – 8°

EXAMPLE:

1. Obstacle Distance (Horizontal From Ref Zero) .... 5200 Ft
2. Obstacle Height (Above Runway Surface) .... 370 Ft
3. Required Net Climb Gradient 8.1%

35A-036

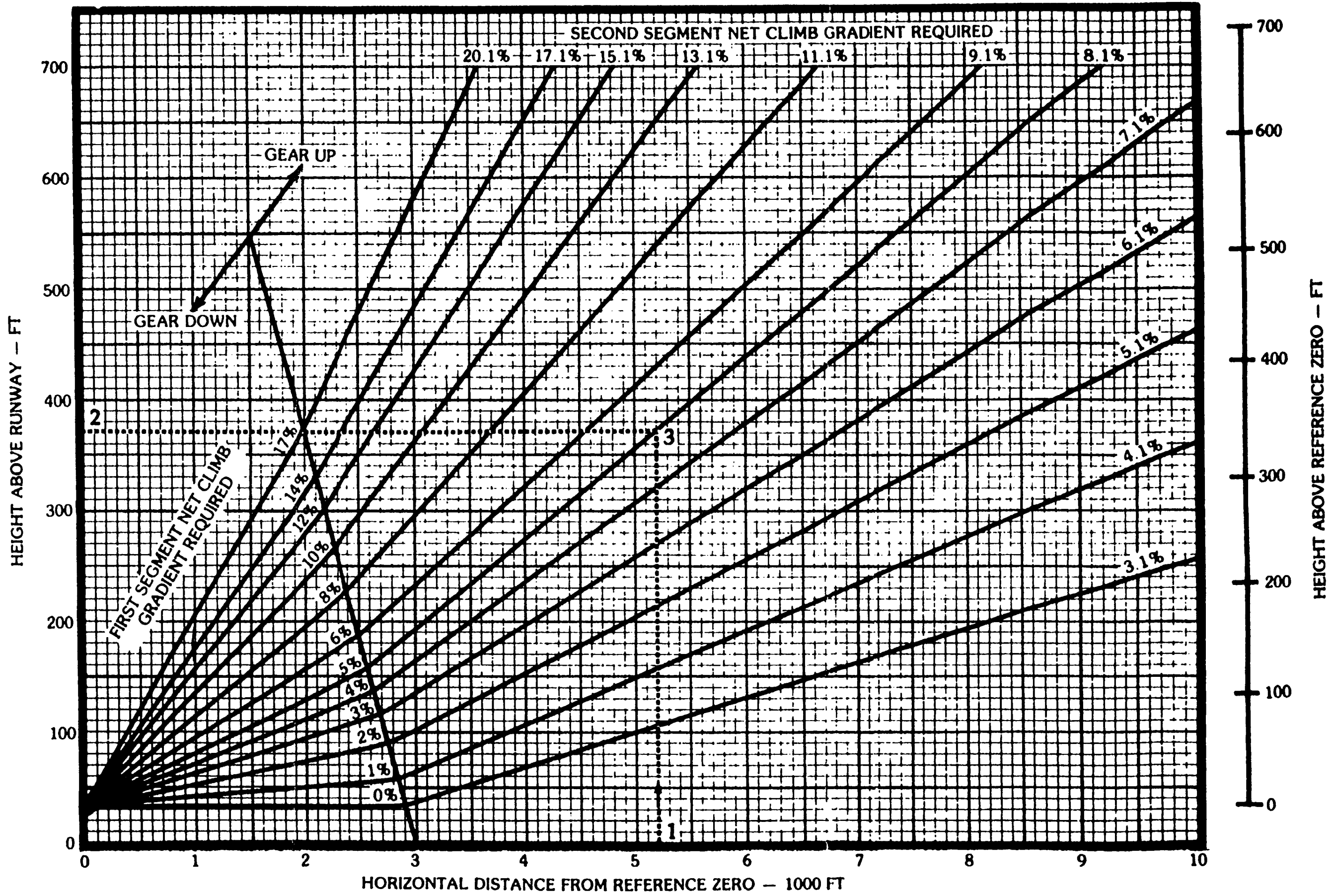


Figure 5-29

DISTANT TAKEOFF FLIGHT PATH
FLAPS – 8°

EXAMPLE:

1. Obstacle Distance
   (Horizontal From Ref Zero)................22,000 Ft
2. Obstacle Height
   (Above Runway Surface)...........................580 Ft
3. Required Net Climb Gradient.......................3%

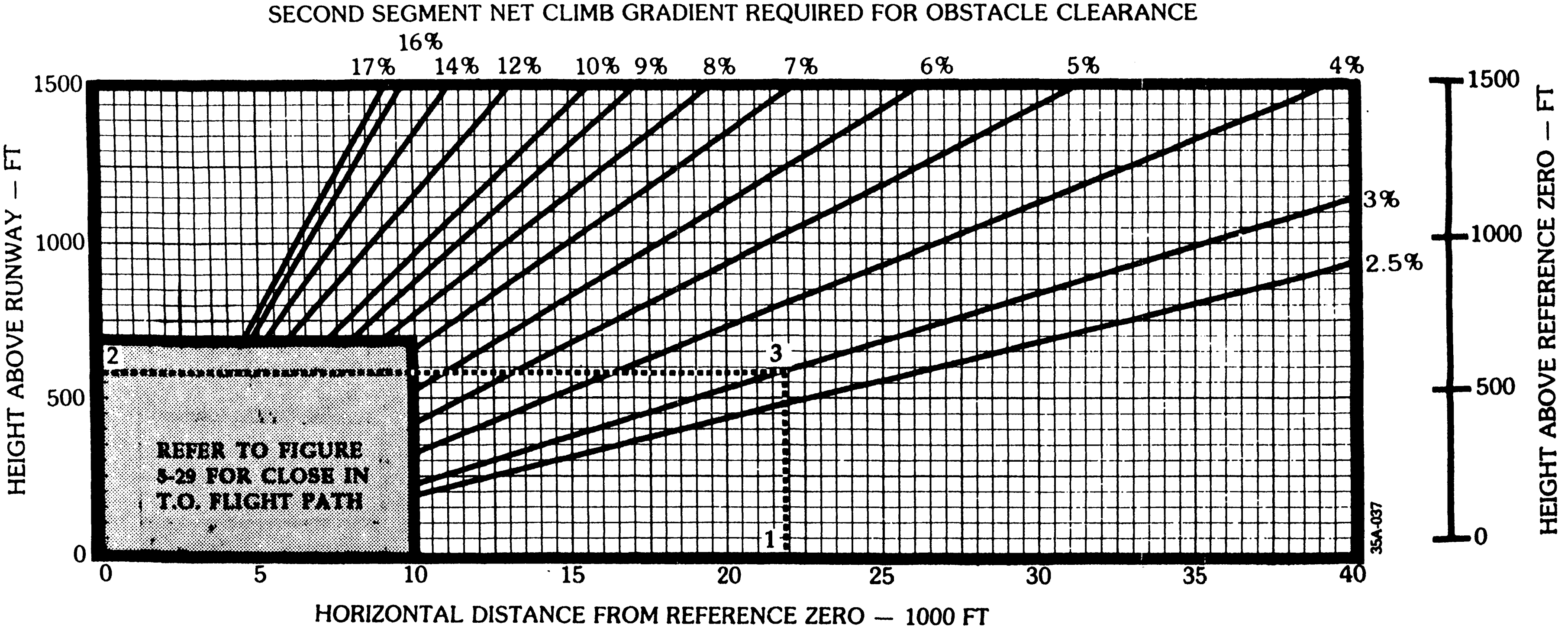


Figure 5-30

FIRST SEGMENT CLIMB GRADIENT FLAPS – 8°

CONDITIONS:

1. Single Engine
2. Takeoff Thrust
3. Gear — Down
4. Flaps — 8°
5. Speed — V_{LOF}

EXAMPLE:

1. Temperature .... 50°F
2. Altitude .... 6000 FT
3. Weight Ref. Line
4. Weight .... 13,000 LB
5. Wind Ref. Line
6. Wind .... 0 KTS
7. Anti-ice Ref. Line
8. Anti-ice .... OFF
9. Net Climb Gradient 7.6%

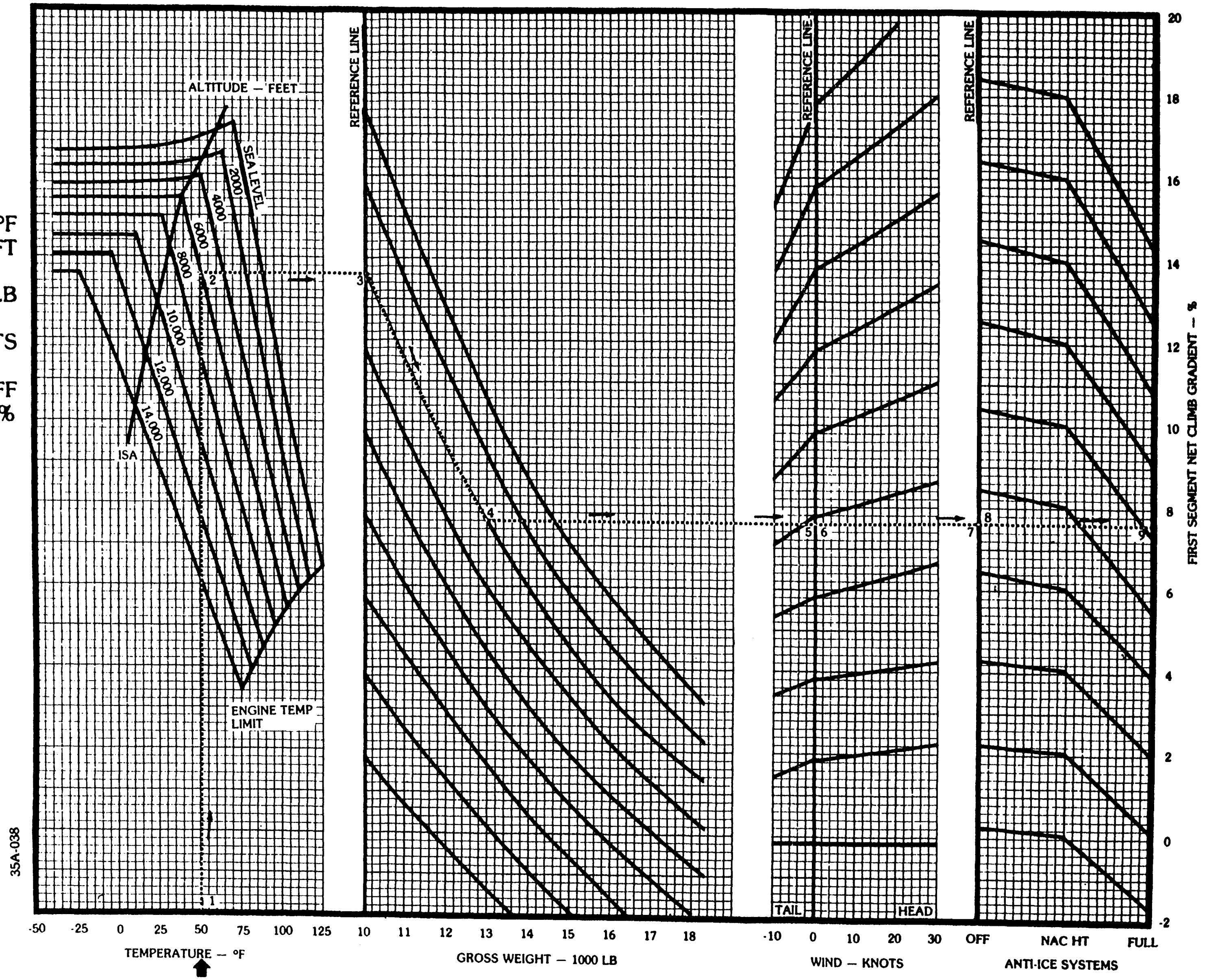


Figure 5-31

SECOND SEGMENT CLIMB GRADIENT FLAPS – 8°

CONDITIONS:

1. Single Engine
2. Takeoff Thrust
3. Gear — Up
4. Flaps — 8°
5. Speed — V_2

EXAMPLE:

1. Temperature . . . . 30°F
2. Altitude . . . . 10,000 FT
3. Weight Ref. Line
4. Weight . . . . 13,000 LB
5. Wind Ref. Line
6. Headwind . . . . 20 KTS
7. Anti-ice Ref. Line
8. Anti-ice . . . . FULL
9. Net Climb Gradient 6.9%

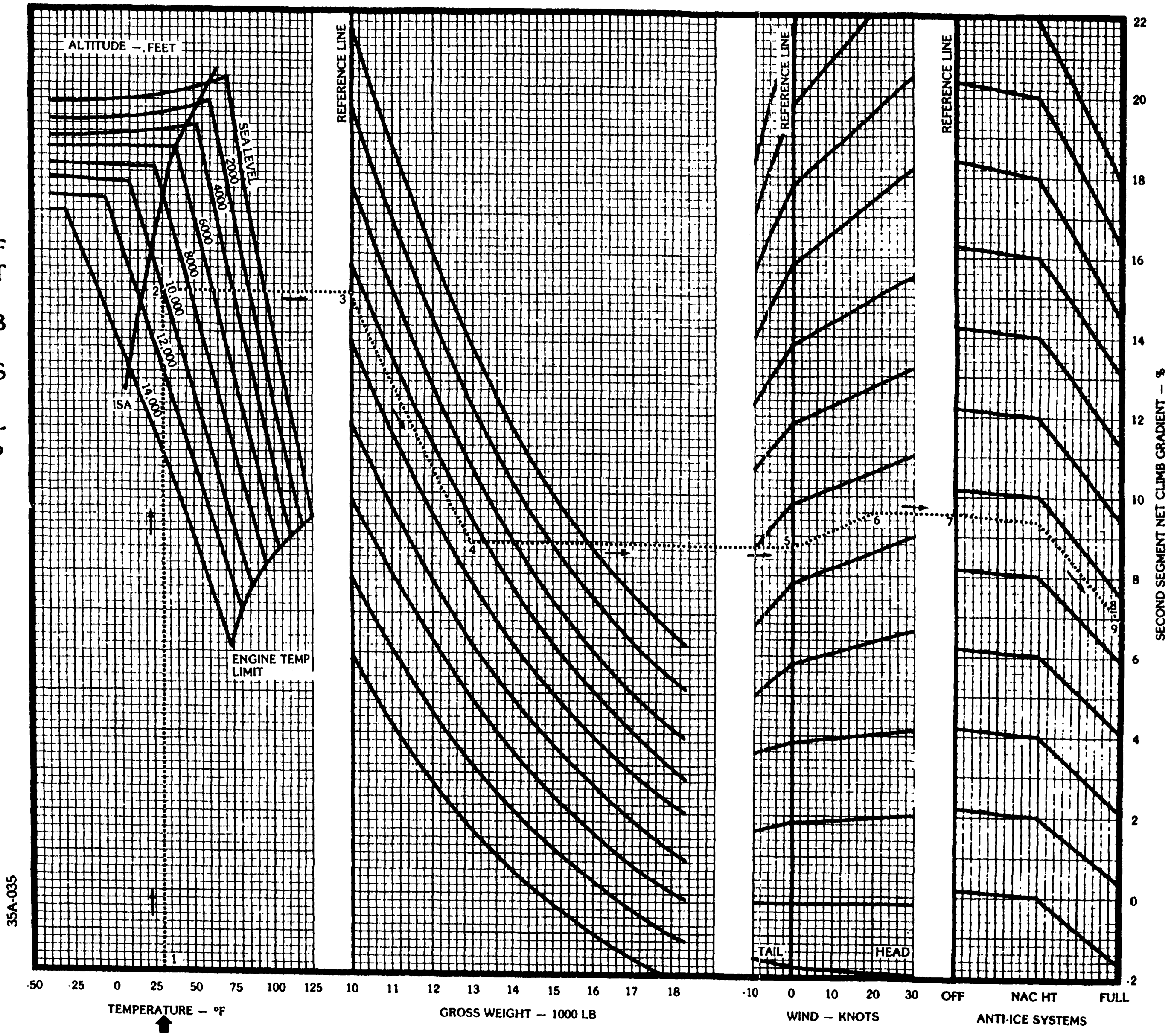


Figure 5-32

TAKEOFF WEIGHT LIMIT
FLAPS – 20° ANTI-ICE – OFF

EXAMPLE:
1. Temperature .... 60°F
2. Altitude .... 8000 FT
3. Takeoff Weight Limit .... 15,880 LB

NOTE: THE VALUE OBTAINED FROM THIS CHART MAY NOT BE THE LIMITING WEIGHT. TAKEOFF WEIGHT IS ALSO LIMITED BY THE MAXIMUM CERTIFIED TAKEOFF WEIGHT AND THE TAKEOFF WEIGHT FOR THE RUNWAY LENGTH AVAILABLE.

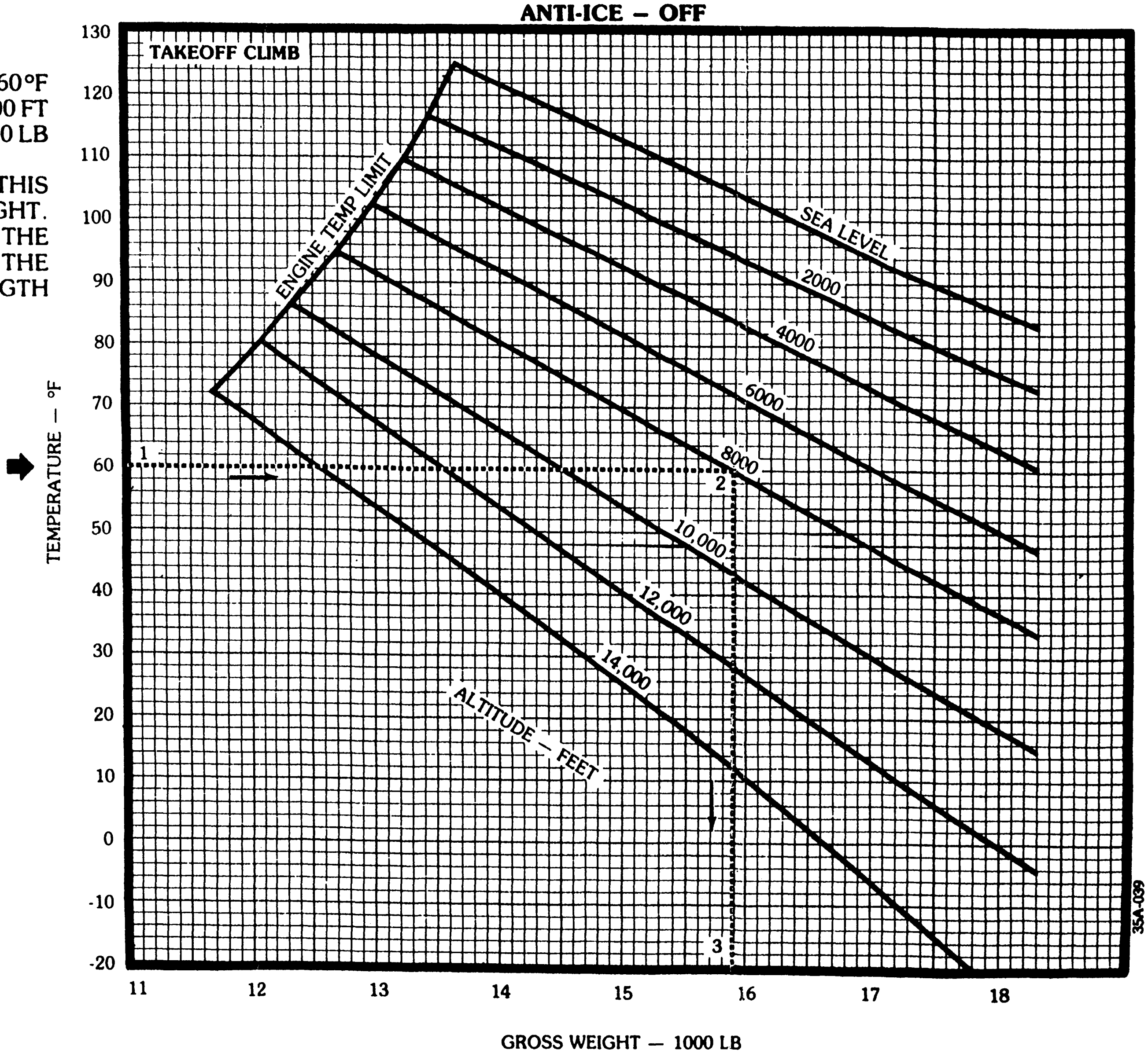


Figure 5-33

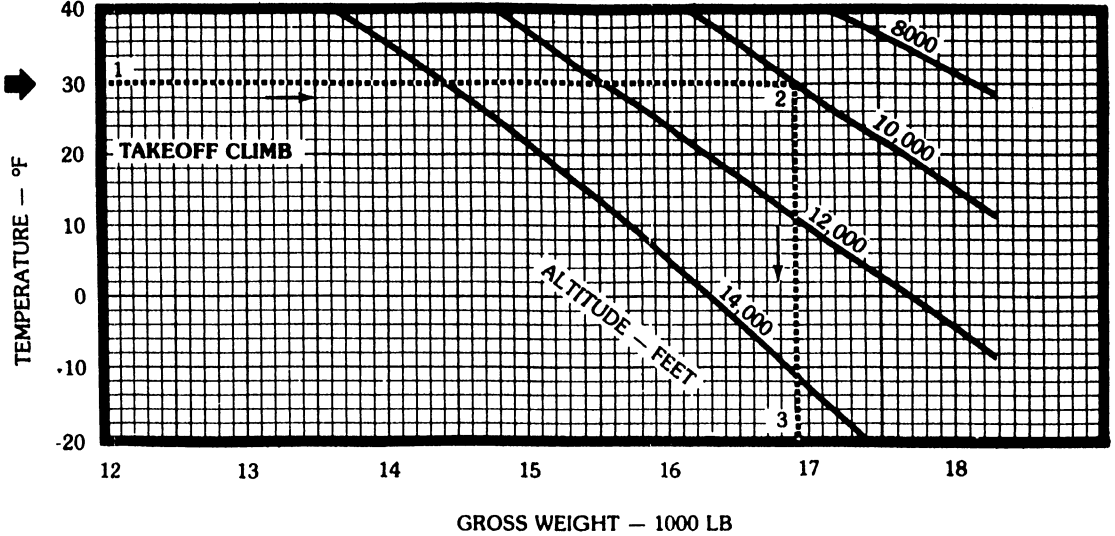
TAKEOFF WEIGHT LIMIT
FLAPS – 20°, ANTI-ICE – ON

EXAMPLE:

1. Temperature .... 30°F
2. Altitude .... 10,000 FT
3. Takeoff Weight Limit
   - Nacelle Heat Only .... 16,920 LB
   - Full Anti-ice .... 15,150 LB

NOTE: THE VALUES OBTAINED FROM THESE CHARTS MAY NOT BE THE LIMITING WEIGHT. TAKEOFF WEIGHT IS ALSO LIMITED BY THE MAXIMUM CERTIFIED TAKEOFF WEIGHT AND THE TAKEOFF WEIGHT FOR THE RUNWAY LENGTH AVAILABLE.

NACELLE HEAT ONLY



FULL ANTI-ICE SYSTEMS

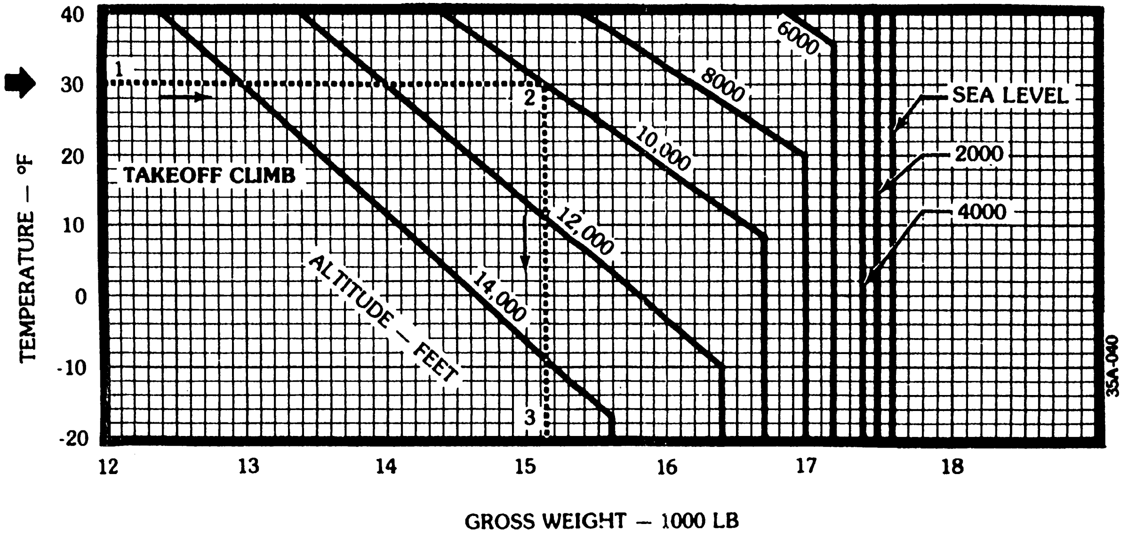


Figure 5-34

TAKEOFF DISTANCE
TAKEOFF WEIGHT
FLAPS – 20°

EXAMPLE (Takeoff Distance):

1. Temperature . . . . 60°F
2. Altitude . . . . 4000 FT
3. Weight Ref. Line
4. Weight . . . . 15,000 LB
5. Wind Ref. Line
6. Headwind . . . . 20 KTS
7. Runway Gradient Ref. Line
8. Runway Gradient . . . 1% UP
9. Anti-skid Ref. Line
10. Anti-skid . . . . ON
11. Anti-ice Ref. Line
12. Anti-ice . . . . OFF
13. Altitude Ref. Line
14. Altitude . . . . 4000 FT
15. Takeoff Field Length 3750 FT

EXAMPLE (Takeoff Weight):

A. Takeoff Field Length . 5100 FT
B. Altitude . . . . 4000 FT
C. Altitude Ref. Line
D. Anti-ice . . . . OFF
E. Anti-ice Ref. Line
F. Anti-skid . . . . ON
G. Anti-skid Ref. Line
H. Runway Gradient . . . . 1% UP
I. Runway Gradient Ref. Line
J. Headwing . . . . 14 KTS
K. Wind Ref. Line
L. Temperature . . . . 85°F
M. Altitude . . . . 4000 FT
N. Weight Ref. Line
O. Intersection Point
P. Takeoff Weight . . . 15,100 LB

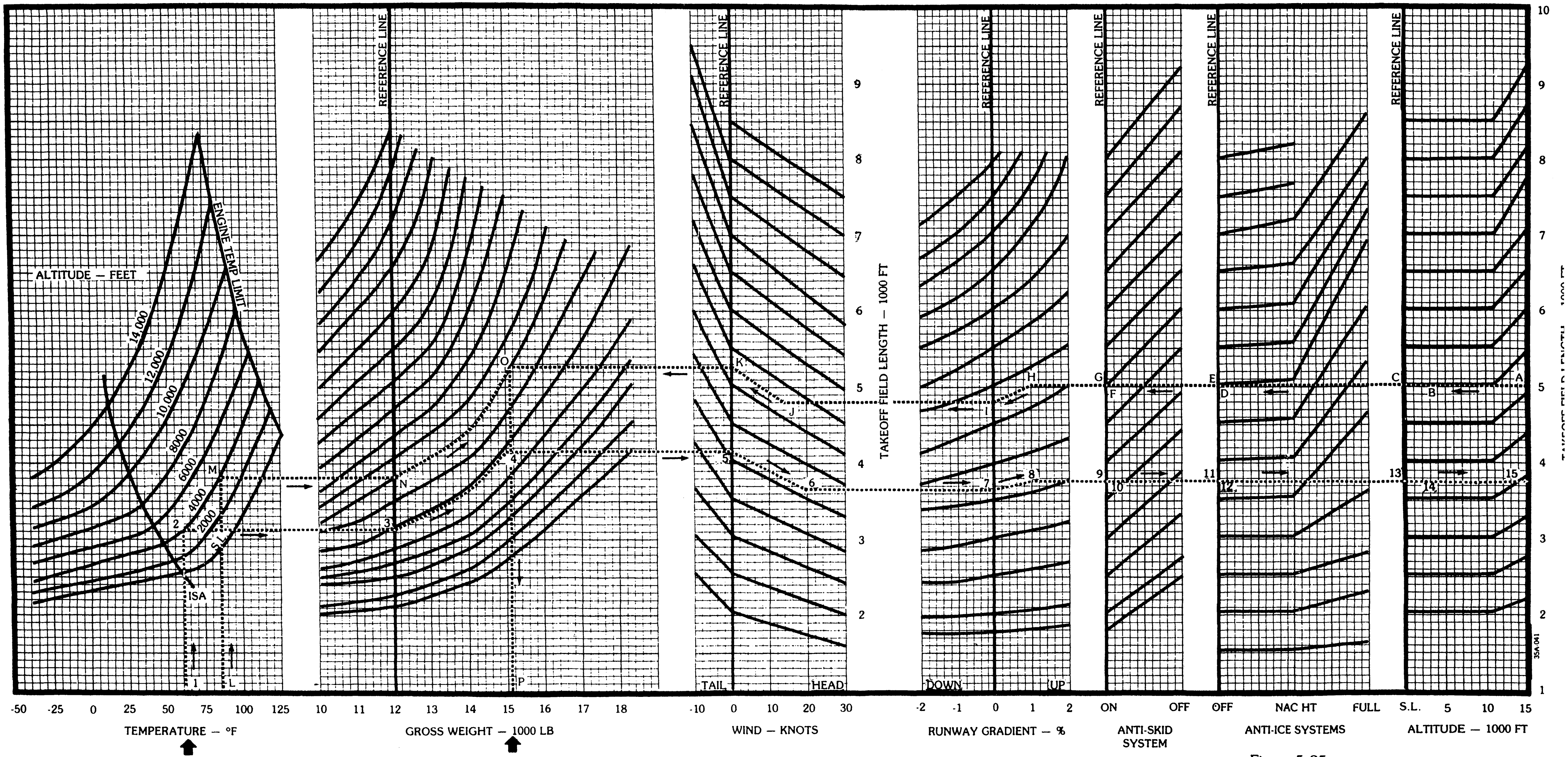


Figure 5-35

CRITICAL ENGINE FAILURE SPEED V(1) FLAPS – 20°

EXAMPLE:

1. Temperature .... 75°F
2. Altitude .... 6000 FT
3. Weight Ref. Line
4. Weight .... 15,000 LB
5. Wind Ref. Line
6. Headwind .... 20 KTS
7. Runway Gradient Ref. Line
8. Runway Gradient .... 1% UP
9. Anti-ice Ref. Line
10. Anti-ice .... OFF
11. Anti-skid Ref. Line
12. Anti-skid .... OFF
13. Critical Engine Failure Speed .... 114.2 KIAS

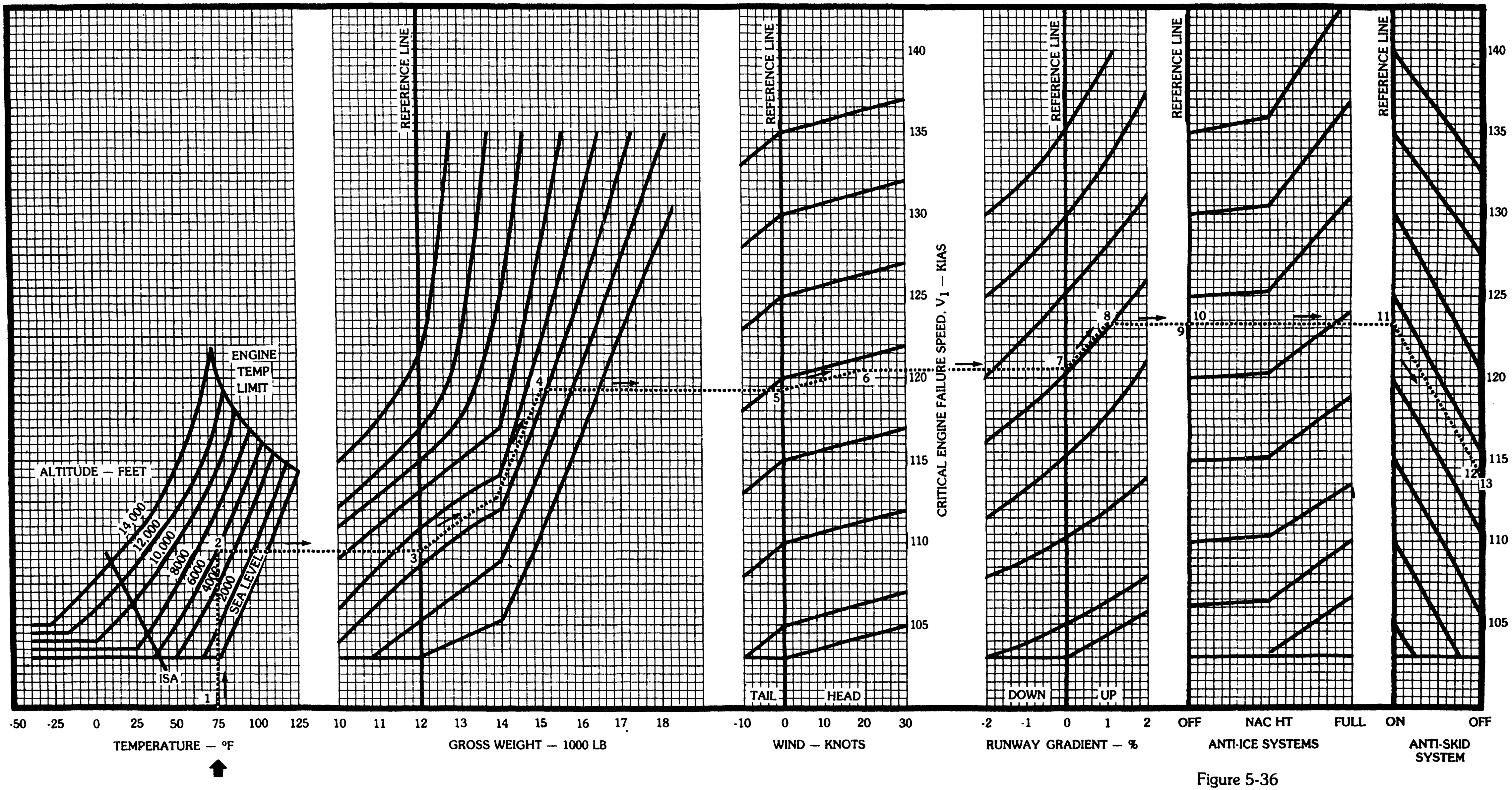


Figure 5-36

ROTATION SPEED (V_R) FLAPS – 20°

EXAMPLE:

1. Weight .... 15,000 LB
2. Rotation Speed .... 127.0 KIAS

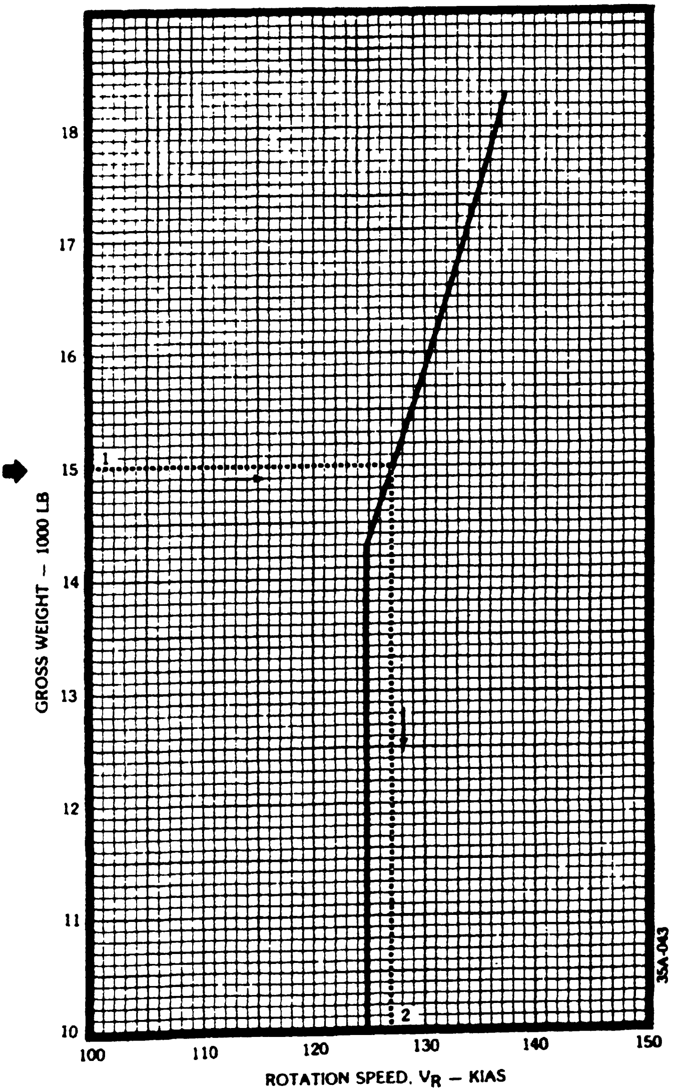


Figure 5-37

TAKEOFF SAFETY SPEED (V_2) FLAPS – 20°

EXAMPLE:

1. Weight .... 16,900 LB
2. Engine Out Safety Speed .... 134.0 KIAS

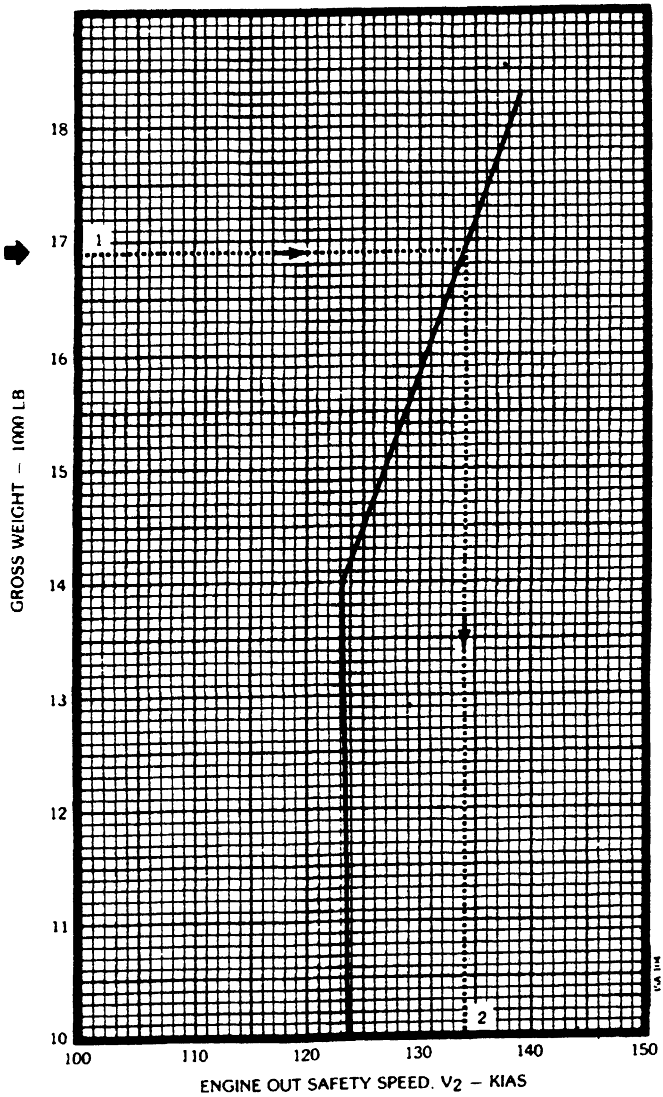


Figure 5-38

CLOSE IN TAKEOFF FLIGHT PATH
FLAPS – 20°

EXAMPLE:

1. Obstacle Distance (Horizontal From Ref Zero) .... 5300 Ft
2. Obstacle Height (Above Runway Surface) .... 360 Ft
3. Required Net Climb Gradient 7.1%

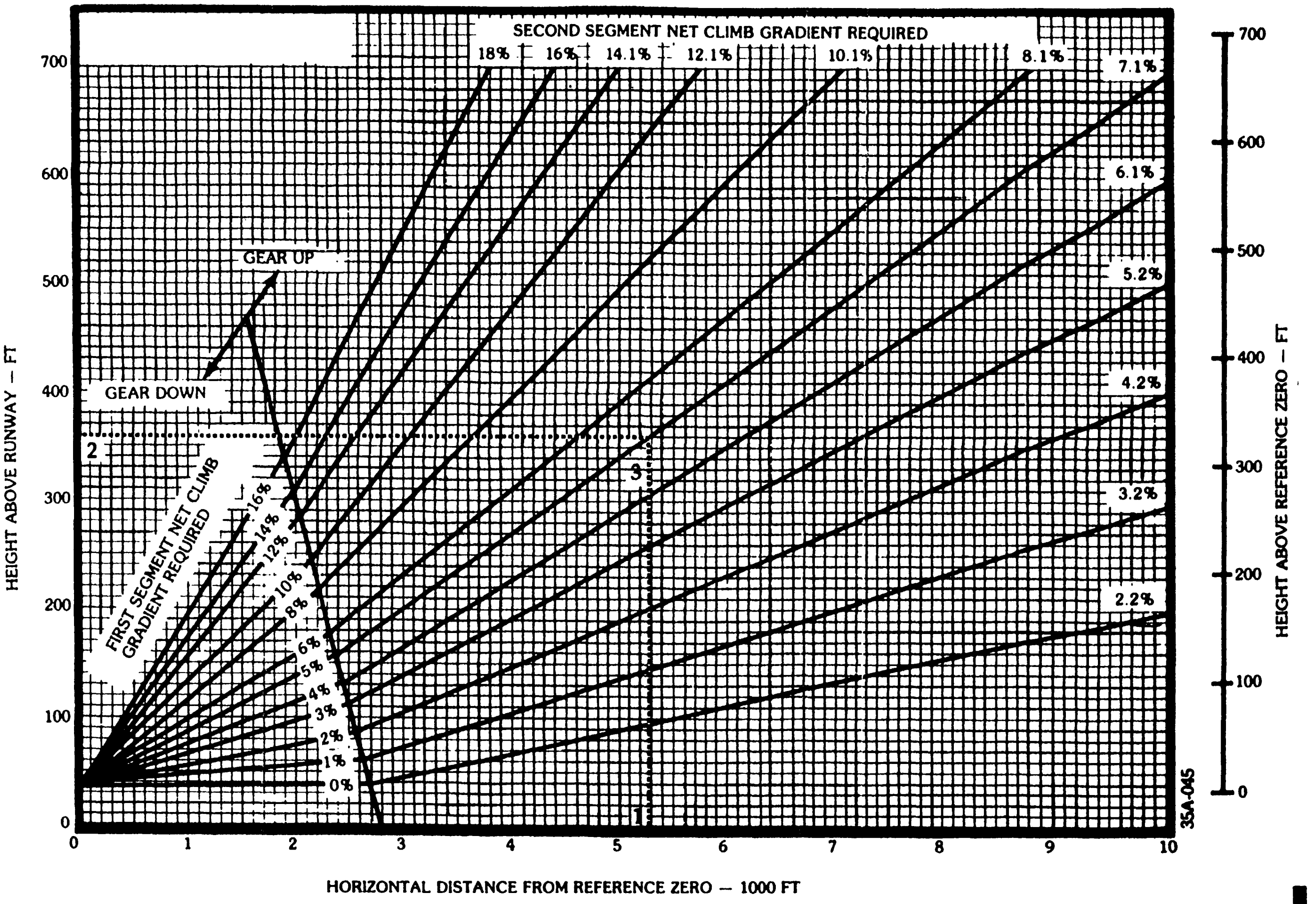


Figure 5-39

DISTANT TAKEOFF FLIGHT PATH
FLAPS – 20°

EXAMPLE:

1. Obstacle Distance
   (Horizontal From Ref Zero)................22,000 Ft
2. Obstacle Height
   (Above Runway Surface)...........................640 Ft
3. Required Net Climb Gradient......................3%

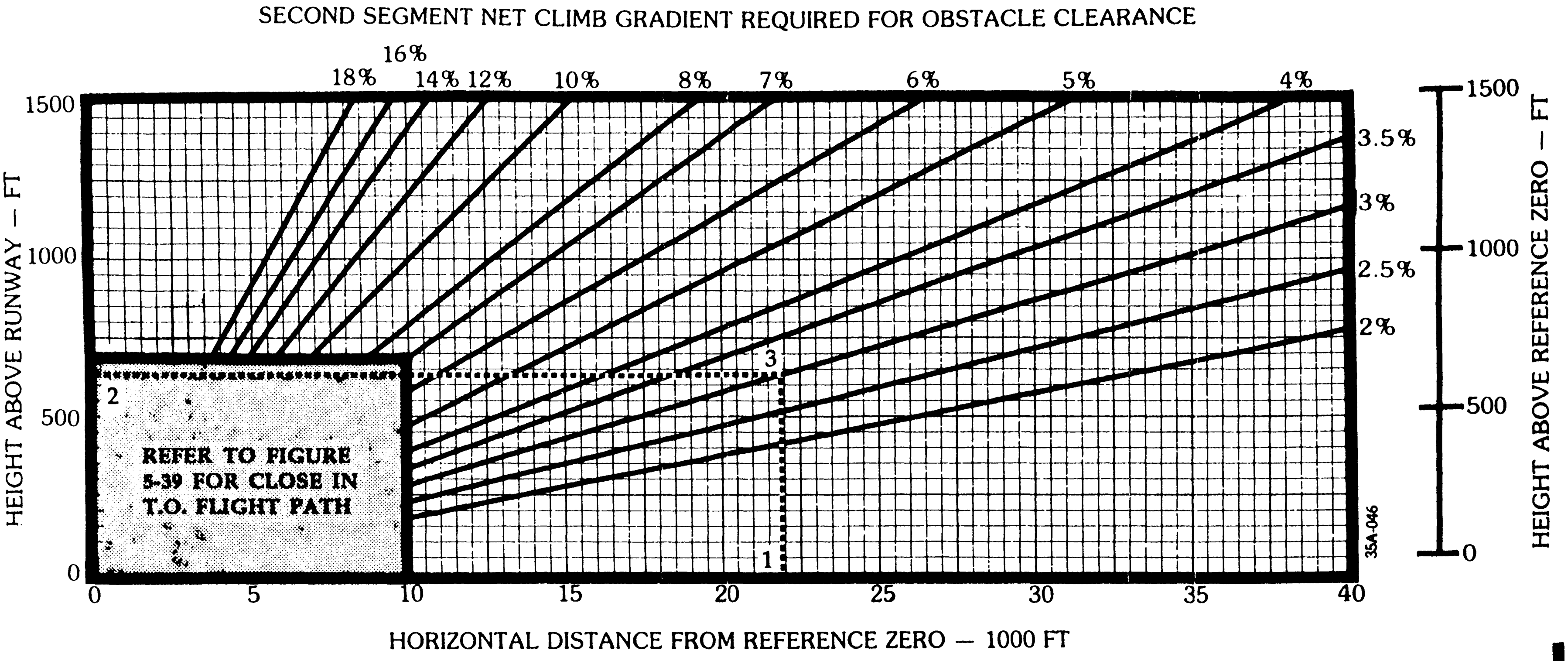


Figure 5-40

FIRST SEGMENT CLIMB GRADIENT
FLAPS — 20°

CONDITIONS:

1. Single Engine
2. Takeoff Thrust
3. Gear — Down
4. Flaps — 20°
5. Speed — V_{LOF}

EXAMPLE:

1. Temperature . . . . 50°F
2. Altitude . . . . 10,000 FT
3. Weight Ref. Line
4. Weight . . . . 13,000 LB
5. Wind Ref. Line
6. Wind . . . . 0 KTS
7. Anti-ice Ref. Line
8. Anti-ice . . . . OFF
9. Net Climb Gradient 3.2%

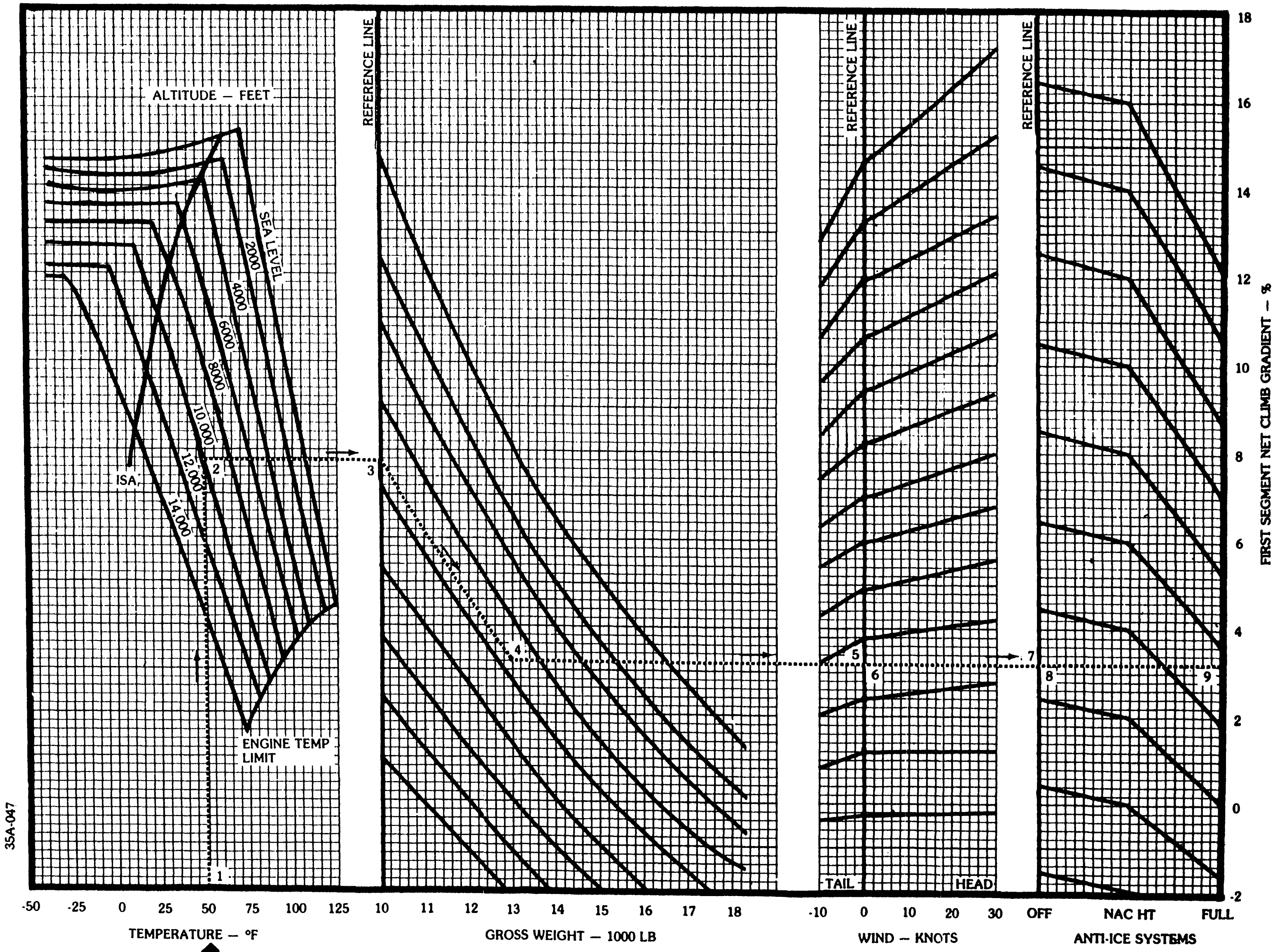


Figure 5-41

SECOND SEGMENT CLIMB GRADIENT FLAPS – 20°

CONDITIONS:

1. Single Engine
2. Takeoff Thrust
3. Gear — Up
4. Flaps — 20°
5. Speed — V_2

EXAMPLE:

1. Temperature . . . . 50°F
2. Altitude . . . . 10,000 FT
3. Weight Ref. Line
4. Weight. . . . . 13,000 LB
5. Wind Ref. Line
6. Tailwind . . . . 10 KTS
7. Anti-ice Ref. Line
8. Anti-ice . . . . OFF
9. Net Climb Gradient 4.4%

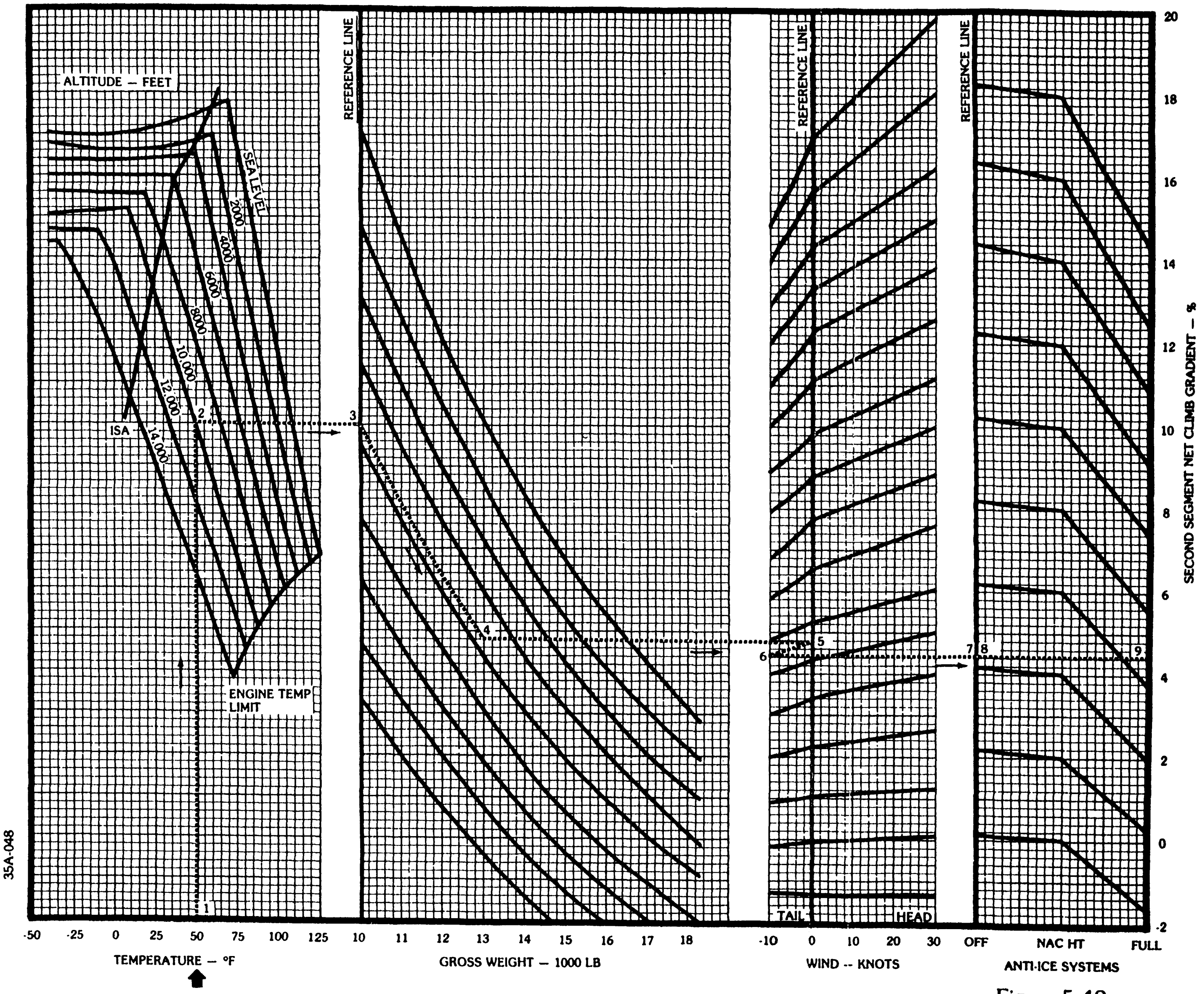


Figure 5-42

FINAL SEGMENT CLIMB GRADIENT

CONDITIONS:

1. Single Engine
2. Maximum Climb Thrust
3. Gear — Up
4. Flaps — Up
5. Speed — 1.25 V_{S1}

EXAMPLE:

1. Temperature . . . . .50°F
2. Altitude . . . . .8000 FT
3. Weight Ref. Line
4. Weight . . . . .14,000 LB
5. Anti-ice Ref. Line
6. Anti-ice . . . . .OFF
7. Net Climb Gradient .5.0%

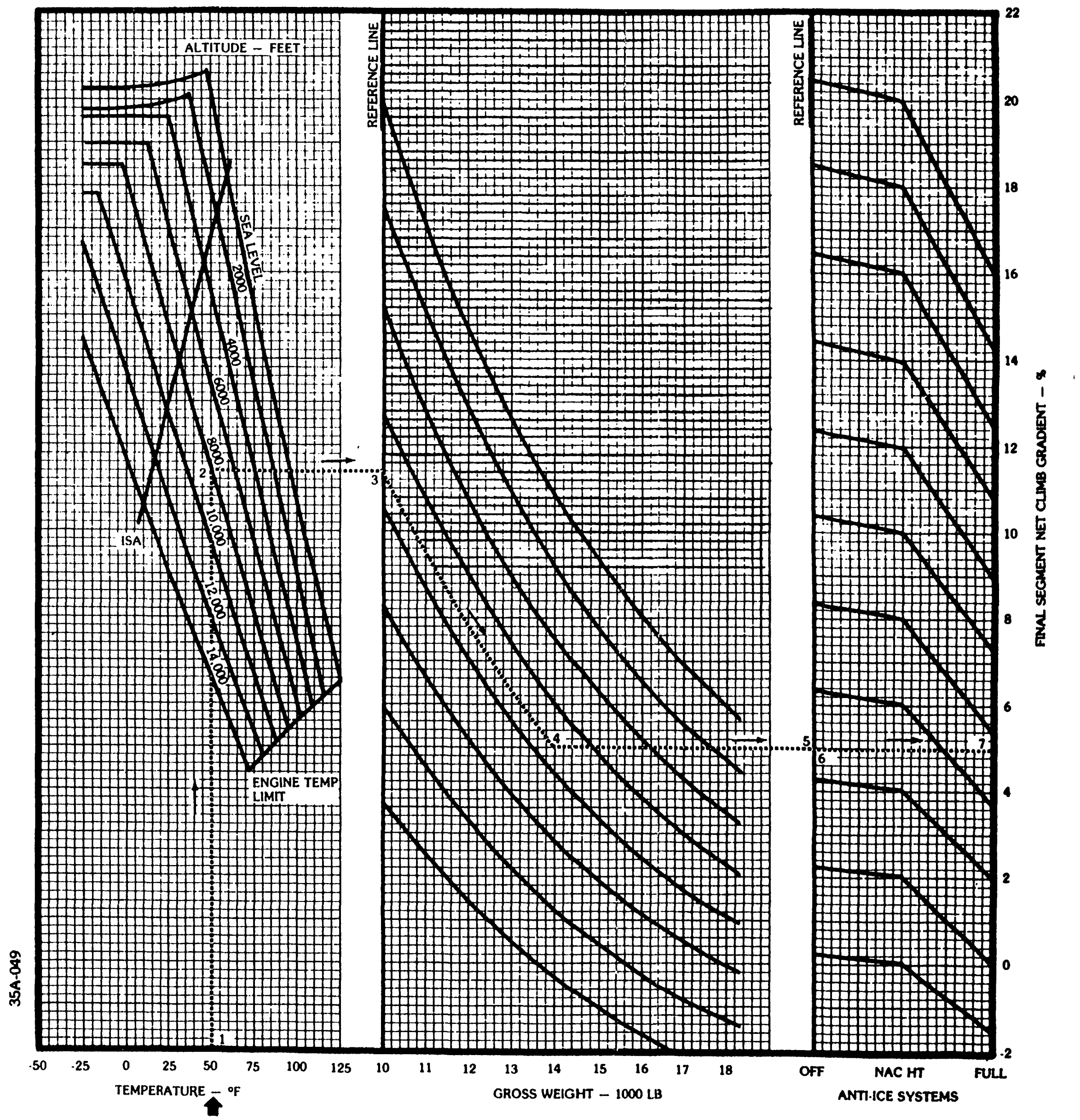


Figure 5-43

ENROUTE CLIMB SPEED SCHEDULE

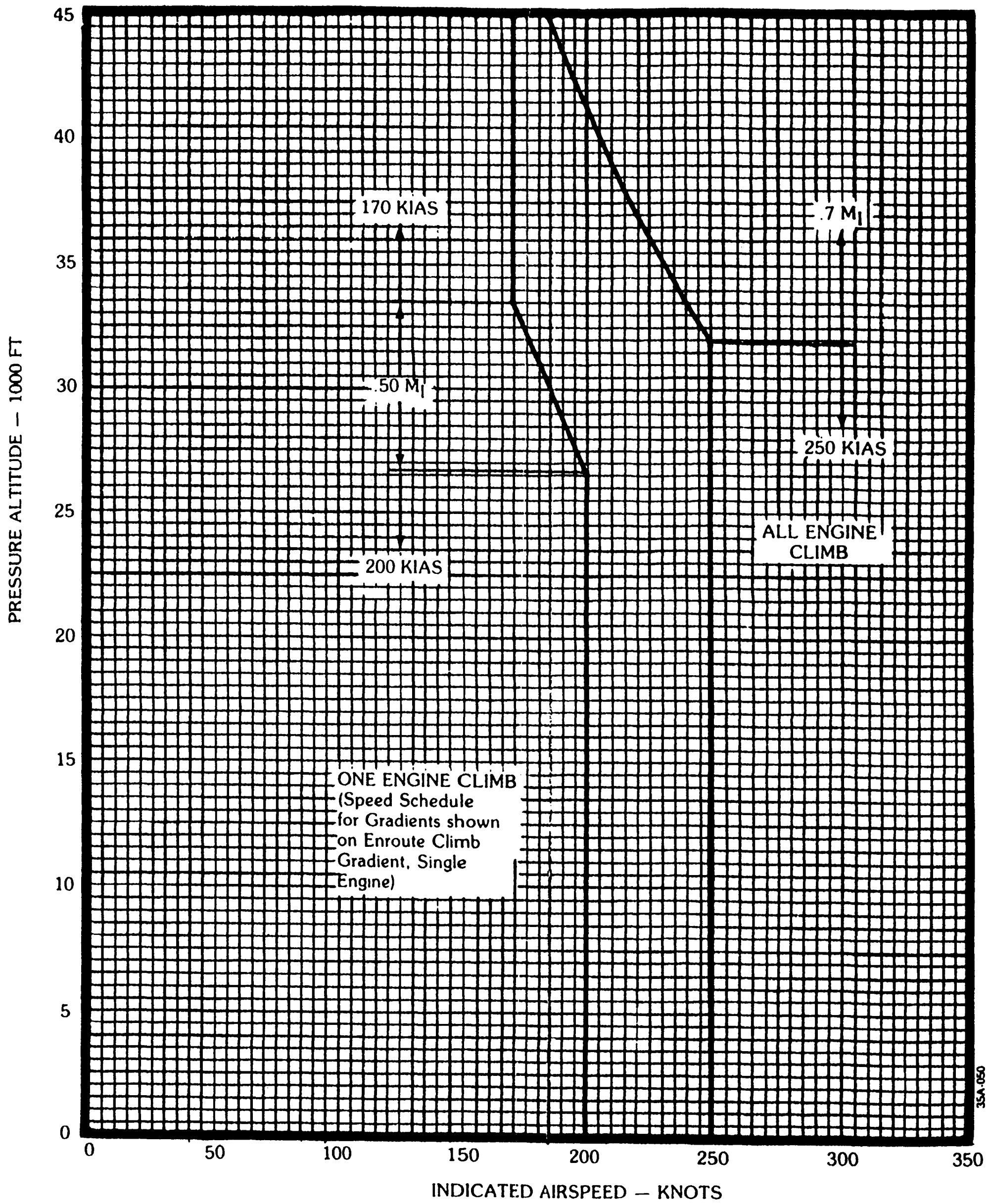


Figure 5-44

ENROUTE CLIMB GRADIENT SINGLE ENGINE

CONDITIONS:

1. Single Engine
2. Maximum Climb Thrust
3. Gear — Up
4. Flaps — Up
5. See ENROUTE CLIMB SPEED SCHEDULE

EXAMPLE:

1. Temperature .... 50°F
2. Altitude .... 15,000 FT
3. Weight Ref. Line
4. Weight .... 15,000 LB
5. Anti-ice Ref. Line
6. Anti-ice .... OFF
7. Net Climb Gradient .... -0.2%

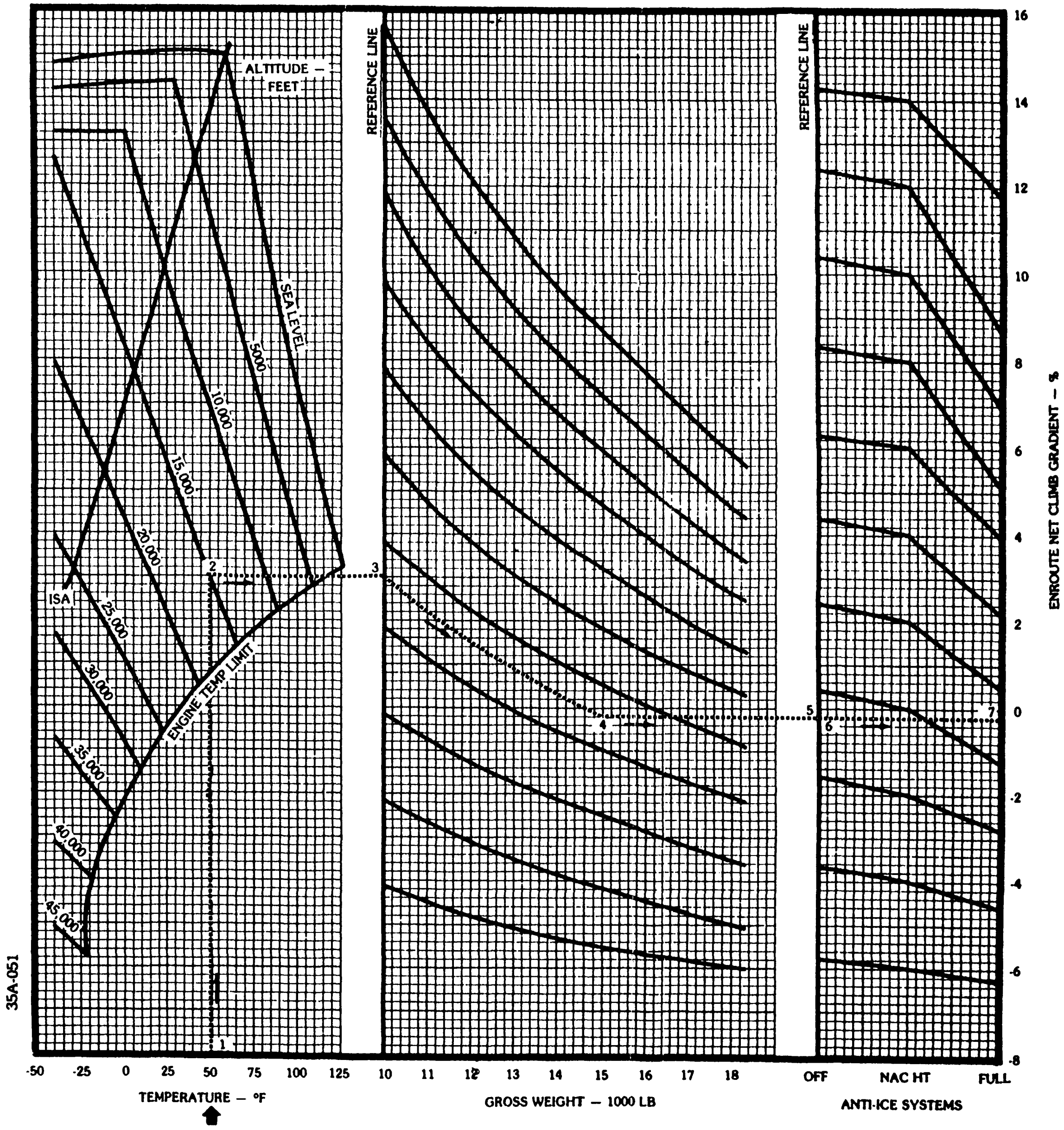


Figure 5-45

USE OF APPROACH AND LANDING CHARTS

The charts on the following pages present approach and landing climb gradients, maximum landing weights as limited by approach and landing climb performance, and landing weights as limited by maximum brake energy.

MAXIMUM LANDING WEIGHT

Landings must be made within the limitations of the maximum landing weight as governed by the LANDING WEIGHT LIMITS Chart and by the performance determined from the ACTUAL LANDING DISTANCE and FACTORED LANDING DISTANCE (if applicable) charts. The heaviest weight at which the aircraft can land is the **lowest** of the following weights:

1. The maximum landing weight (design structural limit for landing) is 14,300 pounds (6,486 Kg) or 15,300 pounds (6,940 Kg).
2. The landing weight limit for airport altitude and temperature as determined from the LANDING WEIGHT LIMITS Chart.
3. The maximum landing weight for the runway and ambient conditions as determined from the ACTUAL LANDING DISTANCE and FACTORED LANDING DISTANCE (if applicable) charts.

NOTE If the aircraft weight over the destination is greater than the lowest of the above weights, fuel must be burned off until the proper weight is achieved.

LANDING DISTANCE CHART

The ACTUAL LANDING DISTANCE Chart shows demonstrated landing distance in terms of altitude, outside air temperature, weight, wind, runway gradient, and anti-skid on or off. The FACTORED LANDING DISTANCE chart shows the operational landing field length when a factored landing distance is required by applicable regulations. The Factored Landing Distance determined from this chart is equal to the Actual Landing Distance divided by 0.60 (multiplied by 1.67). These charts may be used to determine either of the following:

1. The landing field length required given the airplane weight, runway gradient, pressure altitude, temperature, and wind.
2. The maximum landing weight corresponding to a specific runway length, runway gradient, pressure altitude, temperature, and wind. Landing weight for runway length available may be determined by working through the chart in the opposite manner as finding landing distance. Landing weight determined in this manner may not be the limiting landing weight, refer to MAXIMUM LANDING WEIGHT.

USE OF APPROACH AND LANDING CHARTS

LANDING PROCEDURE

The landing distances on the ACTUAL LANDING DISTANCE Chart can be realized when the following procedure is used.

1. Approach through the 50-foot point over the end of the runway at VREF with flaps and gear down, using a 2.5° to 3° glideslope.
2. After passing the 50-foot point, progressively reduce thrust until the thrust levers are at IDLE prior to touchdown.
3. After touchdown, Spoilers — EXT immediately.
4. Wheel Brakes — Apply as soon as practical and continue maximum braking action until the airplane stops.
5. Elevator — Nose up to shift weight to main gear.

LANDING ON WET OR CONTAMINATED RUNWAY

Refer to the WET/CONTAMINATED RUNWAY DATA Addendum for guidance material pertaining to landing on a wet or contaminated runway.

APPROACH CLIMB AND LANDING CLIMB GRADIENT CHARTS

The APPROACH CLIMB GRADIENT and LANDING CLIMB GRADIENT Charts are read at the airport temperature and pressure altitude. The gradients will be achieved using the speeds shown in the APPROACH CLIMB SPEED and LANDING CLIMB SPEED Chart.

CALCULATION OF CORRECTION FOR RUNWAYS WITH A GRADIENT GREATER THAN 2.0% AND LESS THAN OR EQUAL TO 2.4%

The information provided here is used to calculate landing corrections for dry conditions with runway gradients >2.0% and ≤2.4%.

DOWNHILL (NEGATIVE) GRADIENT

Landing Weight Limit
Determine Climb Weight Limit using the appropriate chart in this section. Additional correction is not required.

Determine Brake Energy Weight Limit using the appropriate chart in this section and assume runway has a -2.0% gradient. If necessary, adjust the Brake Energy Weight Limit by subtracting the appropriate weight from the table below.

Landing Weight Limit	
Downhill Gradient	**Brake Energy Weight Correction**
-2.1%	Subtract 25 pounds (11.3 kg)
-2.2%	Subtract 50 pounds (22.7 kg)
-2.3%	Subtract 75 pounds (34.0 kg)
-2.4%	Subtract 100 pounds (45.4 kg)

Landing Distance
Determine Landing Distance using the appropriate chart in this section and assume runway has a -2.0% gradient. Add 100 feet (30.48 m) to the Landing Distance for runway gradients -2.0% to -2.4%.

UPHILL (POSITIVE) GRADIENT

Landing Weight Limit
Determine Climb Weight Limit using the appropriate chart in this section. Adjust the Climb Weight Limit by subtracting the appropriate weight from the table below.

Landing Weight Limit	
Uphill Gradient	**Climb Weight Correction**
+2.1%	Subtract 125 pounds (56.7kg)
+2.2%	Subtract 250 pounds (113.4kg)
+2.3%	Subtract 375 pounds (170.1 kg)
+2.4%	Subtract 500 pounds (226.8 kg)

Determine the Brake Energy Weight Limit using the appropriate chart in this section and assume runway has a +2.0% gradient. Additional correction is not required.

Landing Distance
Determine Landing Distance using the appropriate chart in this section and assume runway has a +2.0% gradient. Additional correction is not required.

APPROACH CLIMB SPEED AND LANDING CLIMB SPEED

EXAMPLE:

1. Weight .... 15,000 LB
2. Approach Climb Speed .... 134.5 KIAS
3. Landing Climb Speed .... 127.0 KIAS

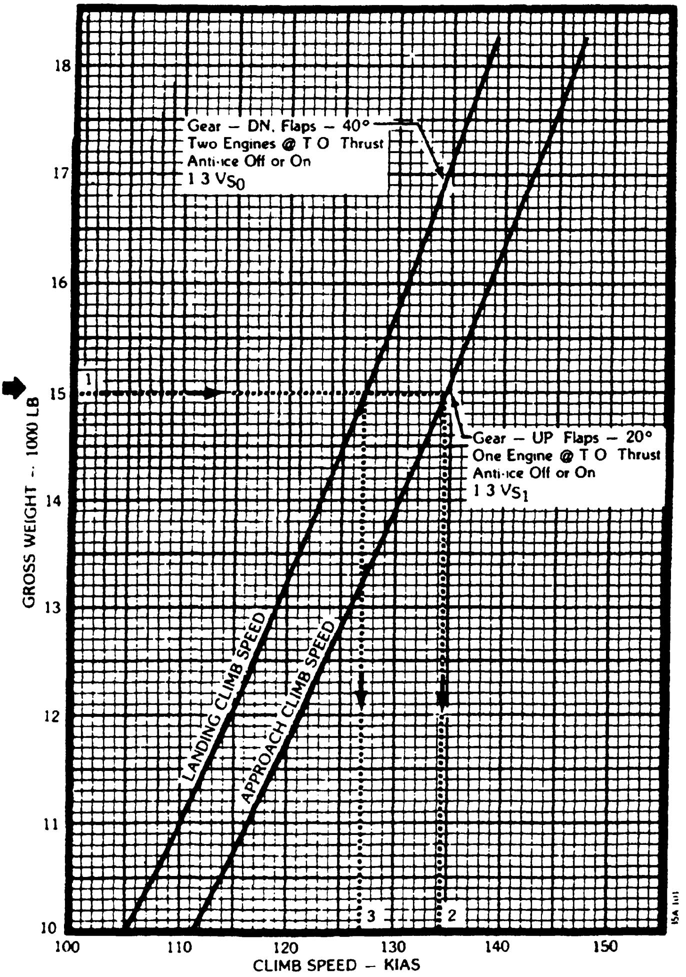


Figure 5-46

APPROACH CLIMB GRADIENT

CONDITIONS:

1. Single Engine
2. Takeoff Thrust
3. Gear — Up
4. Flaps — 20°
5. Speed — 1.3 V_{S_1}

EXAMPLE:

1. Temperature .... 25°F
2. Altitude .... 10,000 FT
3. Weight Ref. Line
4. Weight .... 15,000 LB
5. Anti-ice Ref. Line
6. Anti-ice .... NAC HT ONLY
7. Gross Climb Gradient 4.5%

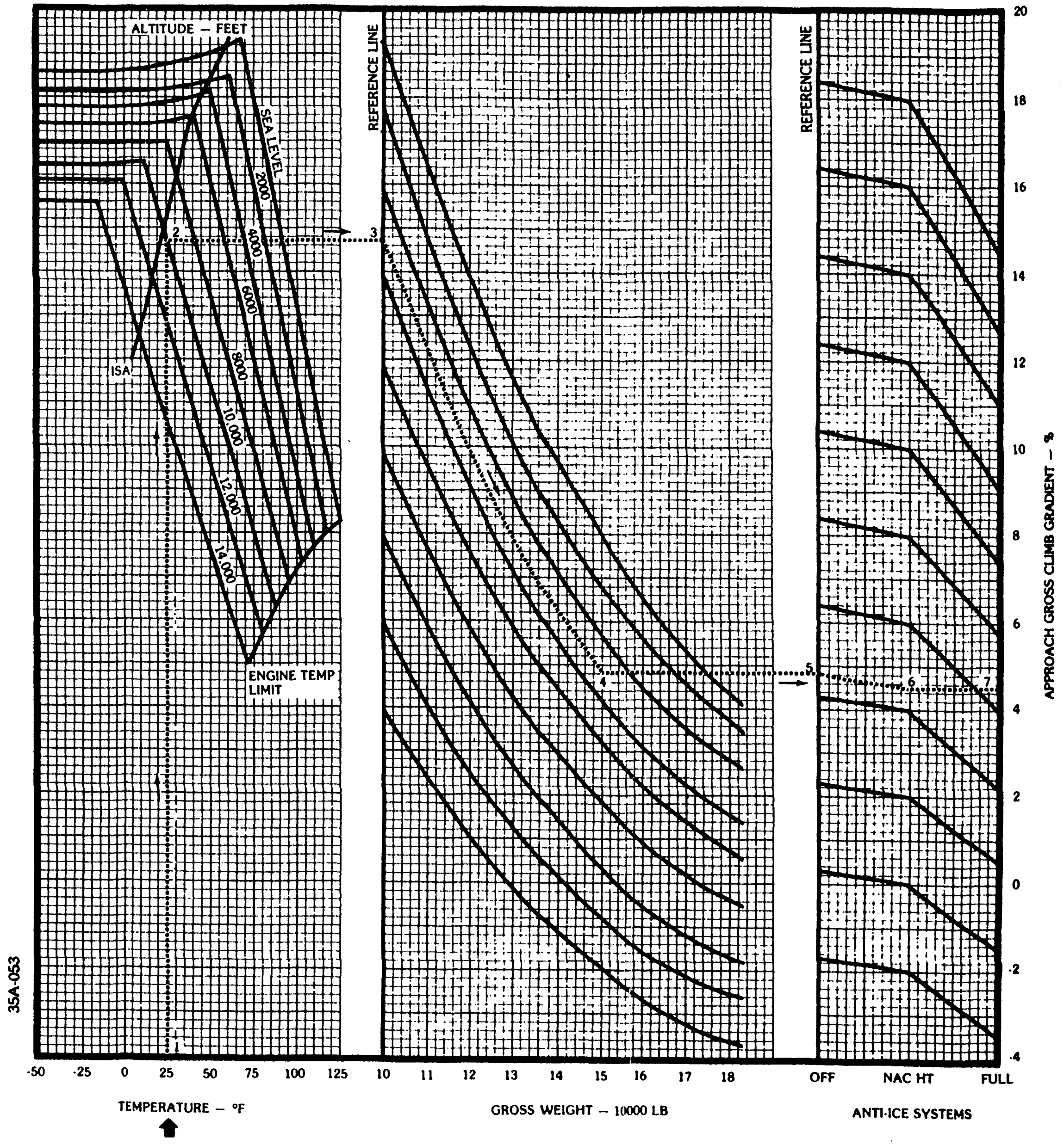


Figure 5-47

LANDING CLIMB GRADIENT

CONDITIONS:

1. Two Engines
2. Takeoff Thrust
3. Gear — Down
4. Flaps — 40°
5. Speed — 1.3 V_{S_0}

EXAMPLE:

1. Temperature .... 75°F
2. Altitude .... 6000 FT
3. Weight Ref. Line
4. Weight .... 14,000 LB
5. Anti-ice Ref. Line
6. Anti-ice .... OFF
7. Gross Climb Gradient 14.5%

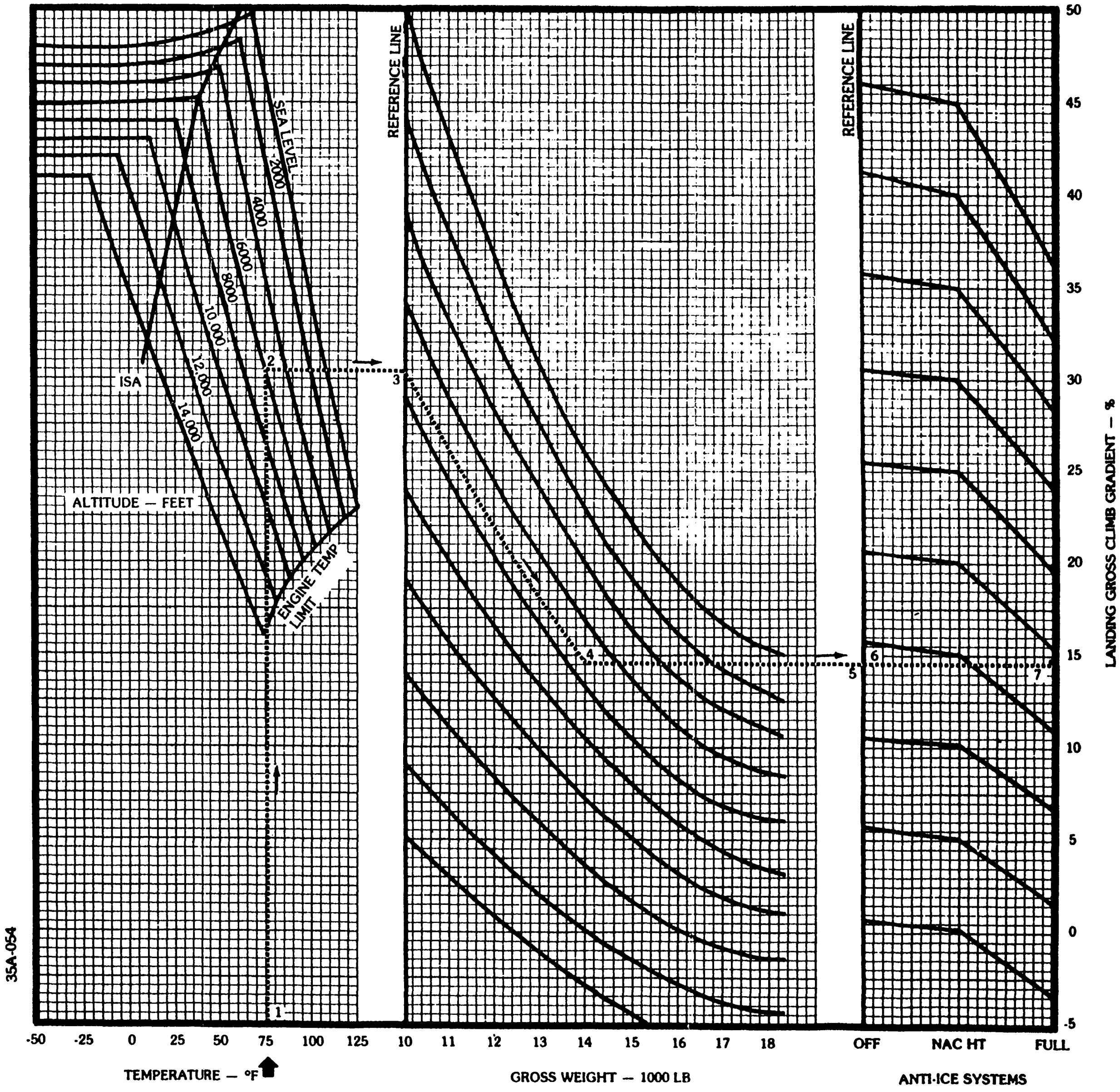
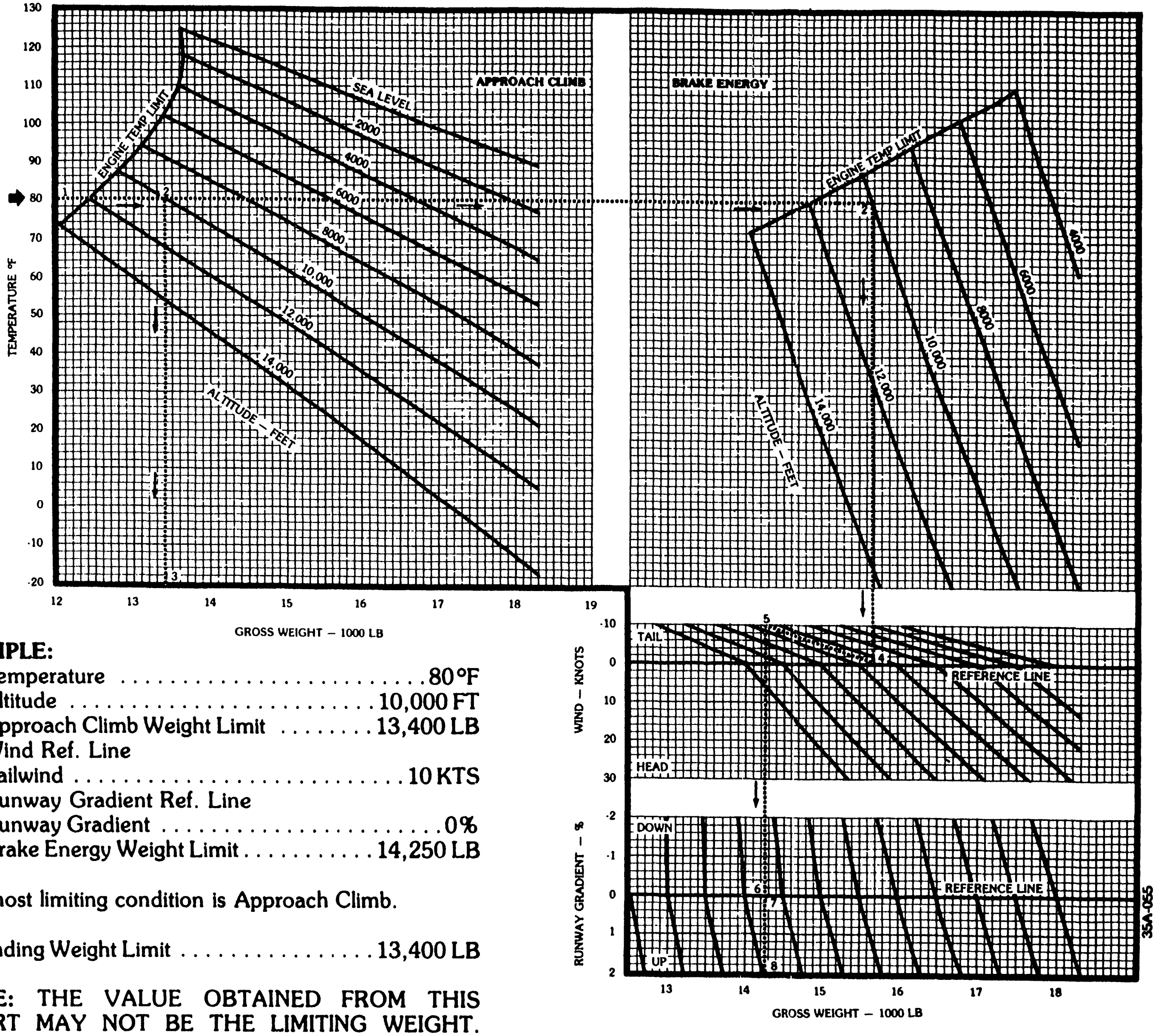


Figure 5-48

LANDING WEIGHT LIMIT
ANTI-ICE – OFF



EXAMPLE:

1. Temperature .... 80°F
2. Altitude .... 10,000 FT
3. Approach Climb Weight Limit .... 13,400 LB
4. Wind Ref. Line
5. Tailwind .... 10 KTS
6. Runway Gradient Ref. Line
7. Runway Gradient 0%
8. Brake Energy Weight Limit .... 14,250 LB

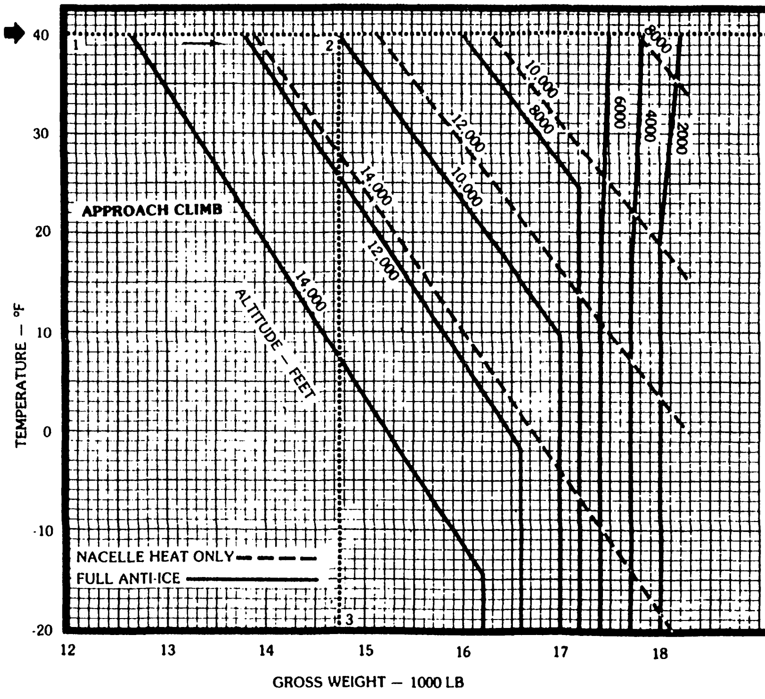
The most limiting condition is Approach Climb.

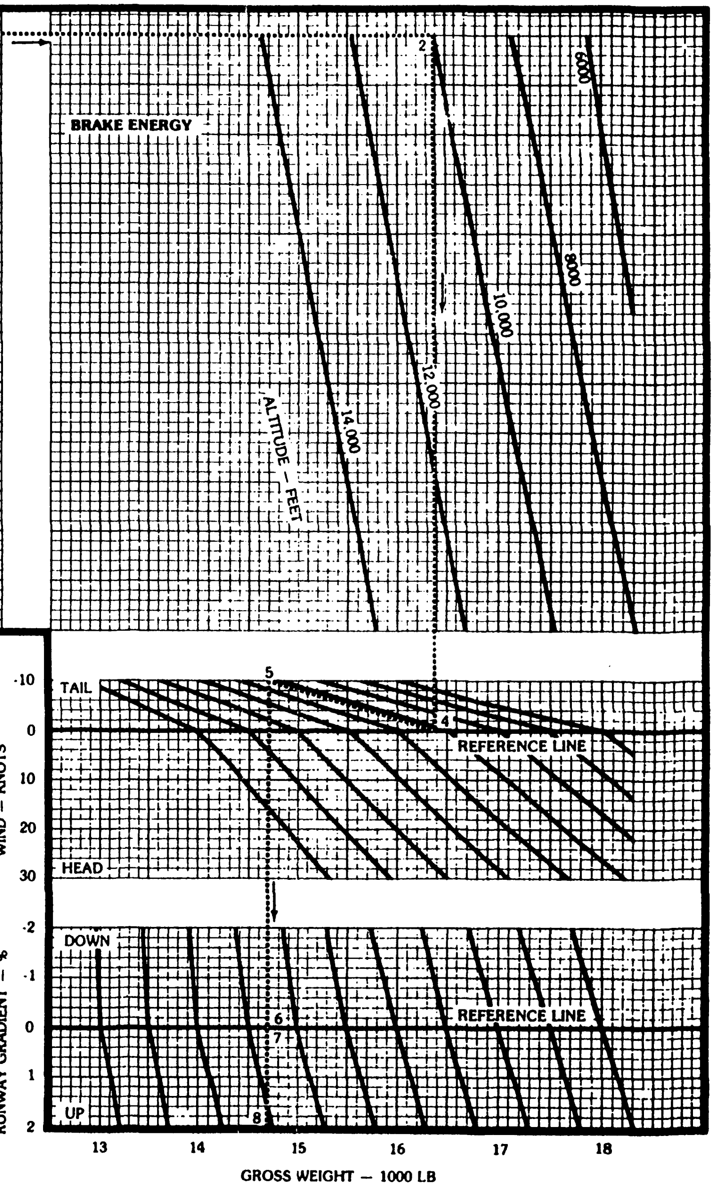
- Landing Weight Limit .... 13,400 LB

NOTE: THE VALUE OBTAINED FROM THIS CHART MAY NOT BE THE LIMITING WEIGHT. LANDING WEIGHT IS ALSO LIMITED BY THE MAXIMUM CERTIFIED LANDING WEIGHT AND THE LANDING WEIGHT FOR THE RUNWAY LENGTH AVAILABLE.

Figure 5-49

LANDING WEIGHT LIMIT
ANTI-ICE – ON





EXAMPLE (Full Anti-ice):

1. Temperature .... 40°F
2. Altitude .... 10,000 FT
3. Approach Climb Weight Limit .... 14,730 LB
4. Wind Ref. Line
5. Tailwind .... 10 KTS
6. Runway Gradient Ref. Line
7. Runway Gradient 0%
8. Brake Energy Weight Limit .... 14,680 LB

The most limiting condition is Brake Energy.

- Landing Weight Limit .... 14,680 LB

NOTE: THE VALUE OBTAINED FROM THIS CHART MAY NOT BE THE LIMITING WEIGHT. LANDING WEIGHT IS ALSO LIMITED BY THE MAXIMUM CERTIFIED LANDING WEIGHT AND THE LANDING WEIGHT FOR THE RUNWAY LENGTH AVAILABLE.

Figure 5-50

LANDING APPROACH SPEED V_{REF}

EXAMPLE:

1. Weight .... 14,500 LB
2. V_{REF} .... 125.0 KIAS

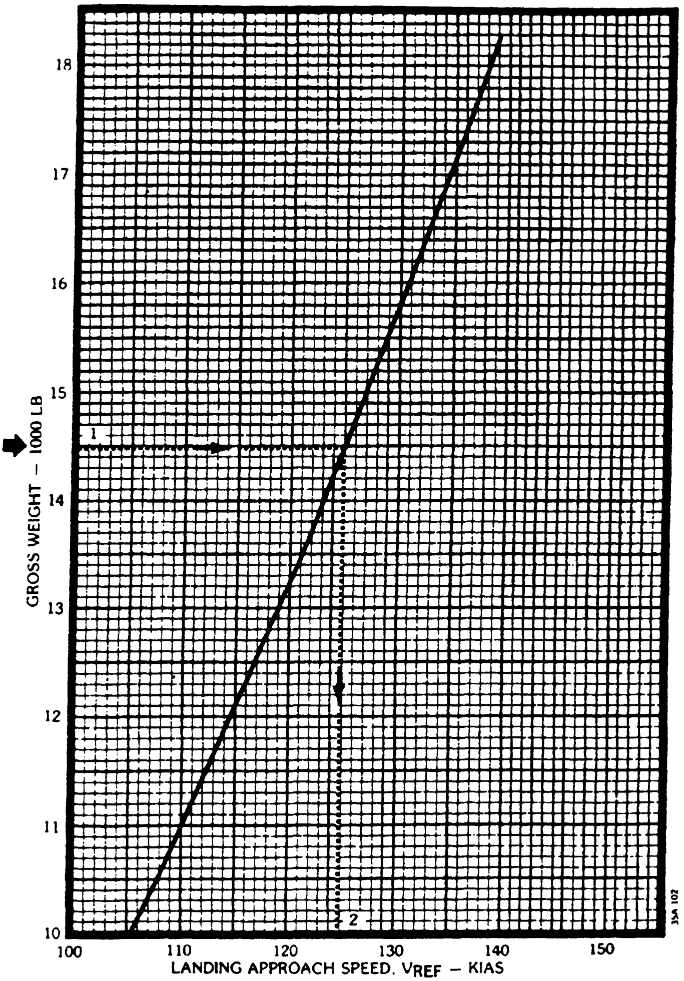


Figure 5-51

ACTUAL LANDING DISTANCE

EXAMPLE:

1. Temperature . . . . 40°F
2. Altitude . . . . 8000 FT
3. Weight Ref. Line
4. Weight . . . . 13,000 LB
5. Wind Ref. Line
6. Headwind . . . . 10 KT
7. Runway Gradient Ref. Line
8. Runway Gradient . . . . 2% UP
9. Anti-skid Ref. Line
10. Anti-skid . . . . OFF
11. Altitude Ref. Line
12. Altitude . . . . 8000 FT
13. Actual Landing Distance . . . . 4480 FT

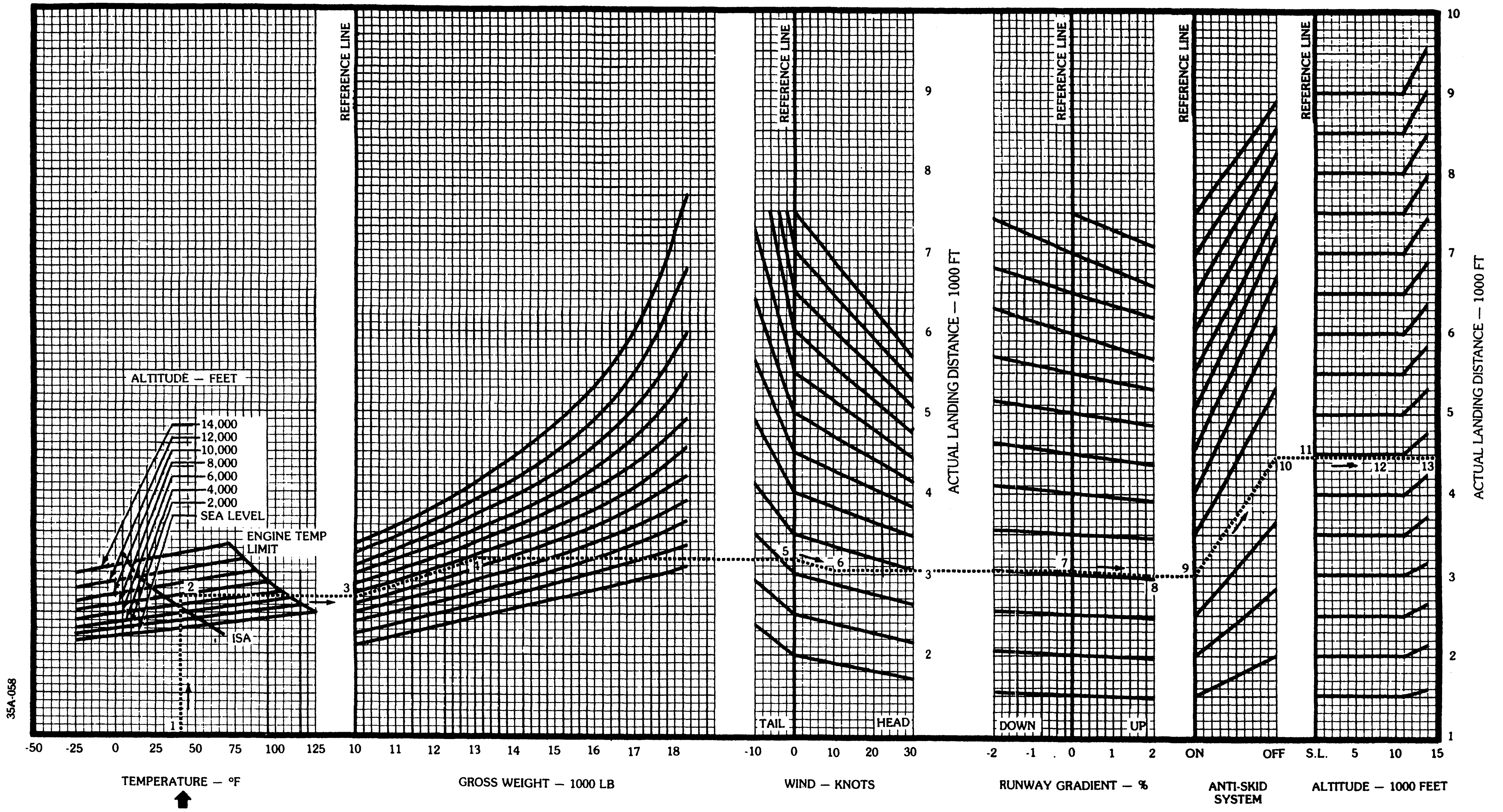


Figure 5-52

FACTORED LANDING DISTANCE

EXAMPLE:

1. Actual Landing Distance ....3,000 FT (914 M)
2. Factored Landing Distance ....5,000 FT (1,524 M)

NOTE: The Factored Landing Distance determined from this chart is equal to the Actual Landing Distance divided by 0.60.

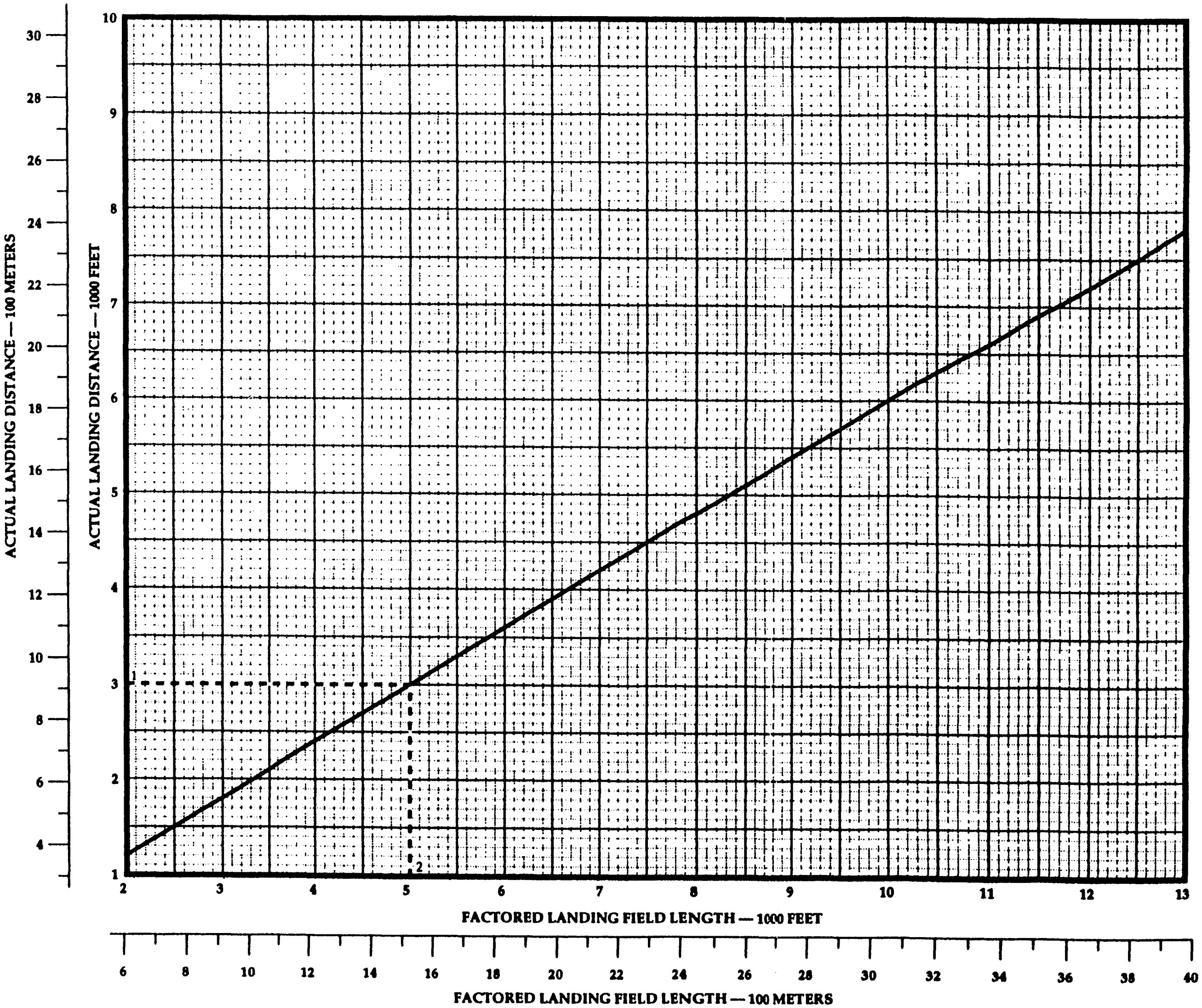


Figure 5-53

AFMS: W1029 **Models:** 35, 35A
36, 36A

When the J.E.T. Model FC-530 Automatic Flight Control System (Autopilot) is installed in the above listed Learjet Aircraft, this Supplement shall apply and must be inserted in the SUPPLEMENTS section of the FAA Approved Airplane Flight Manual.

The information contained herein supplements the information in the basic FAA Approved Airplane Flight Manual. For limitations, operating procedures, and performance information not contained in this Supplement, consult the applicable section in the basic FAA Approved Airplane Flight Manual.

The pilot's flight director indicators have been integrated with the autopilot. For specific information regarding the installed flight director indicators, refer to the applicable Flight Manual Supplement for installed Pilot's Flight Instrument System Indicators Integrated with J.E.T. FC-530 Autopilot/Flight Director.

Other Learjet publications and documents referenced in this supplement are as follows:

SB 35/36-22-5	Modification of FC-530/FC-535 Autopilot Computer
SB 35/36-22-7	Installation of Autopilot Accelerometer Monitor

REISSUE
FAA
APPROVED Gm Baker **DATE** 4/23/85

for MANAGER, WICHITA AIRCRAFT CERTIFICATION OFFICE
FAA CENTRAL REGION
WICHITA, KANSAS

LIST OF EFFECTIVE PAGES

Use this page to determine the current status of this AFM Supplement. Pages affected by the current change are indicated by an asterisk (*) immediately preceding the page number.

Dates of issue for original and changed pages are:

Original	O	9-20-82
Reissued		4-23-85
Change	1	3-11-86
Change	2	2-11-2000

NOTE

This change supersedes and replaces Temporary Flight Manual Change TFM 86-7 dated 8-28-86. Remove superseded Temporary Change from AFM Supplement.

Page	Status
* Title	2
* LOEP	2
* TOC-1 and TOC-2	2
* 1 and 2	2
* 2A (Added)	2
3 thru 8	1
* 9 and 10	2
11 thru 15	1
* 16 thru 20	2
21 thru 25	1
26 and 27	Reissued

INSERT LATEST CHANGED PAGES. DESTROY SUPERSEDED PAGES.

FAA
Approved ______________________ Date 2/11/00

for EVERETT W. PITTMAN, MANAGER
AIRCRAFT CERTIFICATION OFFICE
FEDERAL AVIATION ADMINISTRATION
WICHITA, KANSAS

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SECTION I - LIMITATIONS

The Autopilot/Flight Director system is approved for Category I ILS approaches.

Maximum Operating Speed is VMO/MMO.

When using autopilot, the pilot or copilot must be in the respective seat and the seat belt fastened.

Autopilot pitch and roll axis must **not** be used for takeoff or landing.

The minimum altitude for use of the autopilot is as follows:

- Aircraft configured for cruise — 1000 feet AGL.
- Aircraft configured for approach — 200 feet AGL.

The maximum lateral fuel imbalance for use of the autopilot is 200 pounds.

If severe turbulence is encountered, use attitude hold mode with soft (SFT) mode engaged.

Autopilot may **not** be used in any axis which fails Autopilot Monitor Check.

Autopilot must be disengaged before switching static sources.

On aircraft 35-002 thru 35-626 except 35-620 and 36-002 thru 36-056, except aircraft incorporating SB 35/36-22-5:

- Flight Director VOR en route and approach operations are prohibited.

NOTE Autopilot coupled VOR operations and raw data displays are not affected and may be used.

- For autopilot VOR approach, the flaps must be lowered to 8° or more.

On aircraft 35-620, 35-627 & subsequent, aircraft 36-057 & subsequent, and prior aircraft incorporating SB 35/36-22-5:

For VOR approach, the flaps must be lowered to 8° or more.

SECTION II - NORMAL PROCEDURES

NOTE Before performing engaged operational tests of the autopilot, ensure that aircraft flight controls are unlocked and full control movement is unrestricted.

AUTOPILOT OPERATIONAL CHECK

1. All Autopilot Circuit Breakers — Check, in.
2. Battery Switches — On.
3. INVERTER Switch(es) — On.
4. Pitch Trim — Set within T.O. segment on PITCH TRIM indicator and PITCH TRIM Switch — PRI.
5. AUTOPILOT Switch — On. The PWR annunciator on the autopilot controller will illuminate.
6. TST Button — Depress. All annunciators on the autopilot controller shall illuminate.
7. Autopilot Monitors — Check.

NOTE It is not required that the Attitude Director Indicator (ADI) and Horizontal Situation Indicator (HSI) flags be retracted in order to complete the autopilot monitor check.

   a. ENG and TST Buttons (autopilot controller) — Depress simultaneously, then release. MON, Pitch and Roll annunciators shall illuminate then go out and the disengage tone will sound. The Roll annunciator will go out in approximately 8 seconds and the Pitch annunciator will go out in approximately 11 seconds. The LVL ON annunciator will illuminate when the Roll annunciator goes out. PWR annunciator will remain illuminated.

NOTE If the test fails, the failed axis (Pitch and/or Roll) annunciator(s) will start flashing and continue to flash and the MON annunciator will remain illuminated. The pattern of the flashes may be used by maintenance personnel for troubleshooting. The failed axis annunciator(s) will continue to flash and the MON annunciator will remain illuminated until the AUTOPILOT switch is cycled. Autopilot must **not** be used in any axis which fails the autopilot monitor check. If it is intended to use autopilot with a failed axis, the failed axis DC circuit breaker (AFCS PITCH or AFCS ROLL, pilot's ess bus) must be pulled.

AUTOPILOT OPERATIONAL CHECK (CONT)

b. *On aircraft incorporating SB 35/36-22-7,* Accelerometer Monitor — Check.
   (1) ENG Button (autopilot controller) — Depress. Pitch and Roll annunciators shall illuminate.
   (2) ENG and BC Buttons (autopilot controller) — Depress simultaneously, then release. After a 2 to 10 second delay, the Pitch and Roll annunciators will go out and the disengage tone will sound. Test fails if the autopilot does not disengage within the 2 to 10 second time.

NOTE

Autopilot pitch axis must not be used if the accelerometer monitor check fails.

AUTOPILOT OPERATIONAL CHECK (CONT)

8. Autopilot Engagement and Disengagement Checks:

NOTE

- Prior to engaging autopilot, assure that Attitude Director Indicator (ADI) and Horizontal Situation Indicator (HSI) gyro flags are retracted. This indicates that gyros have been energized long enough to time-out erection cycles (approximately 90 seconds).
- The autopilot is engaged by depressing the ENG button on the autopilot controller. Verify autopilot engages by illumination of the Roll and Pitch annunciators and autopilot opposition to elevator and aileron control movement.
- If the control column is trimmed neutral or aft when the autopilot is engaged during ground operation, the autopilot pitch trim monitor may disengage the autopilot pitch axis.
- When the autopilot disengages, autopilot opposition to control pressure will disappear in both the roll and the pitch axes, the Roll and Pitch annunciators will extinguish, and the autopilot disengage tone will sound.

a. Control Wheel Master Switch (MSW) Disengage — Check:
   (1) ENG Button — Depress.
   (2) Pilot's Control Wheel Master Switch (MSW) — Depress. Autopilot shall disengage.
   (3) Repeat procedure using copilot's Control Wheel Master Switch (MSW).
b. Trim Disengage — Check:
   (1) ENG Button — Depress.
   (2) Pilot's Control Wheel Trim Switch (arming button depressed) — Move to any of the four directions (NOSE UP, NOSE DN, LWD, or RWD). Autopilot shall disengage.
   (3) ENG Button — Depress.
   (4) Repeat step (2) using copilot's Control Wheel Trim Switch.
   (5) ENG Button — Depress.
   (6) PITCH TRIM Switch (pedestal) — OFF. Autopilot shall disengage.
   (7) ENG Button — Depress. Autopilot shall not engage.
   (8) PITCH TRIM Switch (pedestal) — SEC.

AUTOPILOT OPERATIONAL CHECK (CONT)

(9) ENG Button — Depress.

(10) NOSE DN-OFF-NOSE UP Switch (pedestal) — Move either direction. Autopilot shall disengage.

(11) PITCH TRIM Switch — PRI.

c. Go-around Disengage — Check:

(1) ENG Button — Depress.

(2) GO-AROUND Button (left thrust lever knob) — Depress. Autopilot shall disengage and the G/A and LVL ON annunciators shall illuminate.

9. Maneuver Checks:

a. ENG Button — Depress.

b. Select any desired ROLL and PITCH mode.

c. While holding moderate pressure on the control wheel and column, depress pilot's MANUV R/P switch. Autopilot opposition to control pressure shall disappear, the Pitch and Roll annunciators shall go out, the selected modes shall remain engaged, and the autopilot disengage tone shall not sound. Then release MANUV R/P switch and note that autopilot opposition to control movement resumes, and the Pitch and Roll annunciators illuminate.

d. Repeat step c using copilot's MANUV R/P switch.

e. Either MANUV R/P Switch — Depress. Then actuate either Control Wheel Trim Switch (arming button depressed) in any direction. Trim inputs shall not disengage the autopilot while the MANUV R/P Switch is depressed.

10. Attitude Command Check:

a. Pilot's Control Wheel Trim Switch (arming button **not** depressed) — Move switch barrel to NOSE UP, NOSE DN, LWD, and RWD. Control column or wheel shall respond by moving in the direction commanded.

b. Repeat step a using copilot's Control Wheel Trim Switch.

11. Overpower and Out-of-Trim Monitor Checks:

NOTE

If the pitch or roll servo becomes saturated due to continuous overpower forces or command against the stops for approximately 30 seconds, the out-of-trim monitors will cause the applicable (Pitch or Roll)annunciator to flash.

a. Control Column — Overpower the autopilot in both the nose-up and nose-down directions. It shall be possible to overpower the autopilot in both directions. The trim-in-motion audio clicker may sound after initiating overpower force. The PITCH force indicator (if installed) will indicate direction of autopilot effort.

AUTOPILOT OPERATIONAL CHECK (CONT)

NOTE A forward or aft overpower force on the control column will, after a short interval, be accepted by the autopilot and autopilot opposing force will disappear. The control column will then remain in the overpower position and autopilot opposition will be centered around the 'new' position of the control column.

b. Control Wheel Master Switch (MSW) — Depress.
c. Control Column — Full forward.
d. ENG Button — Depress.
e. Control Wheel — Overpower the autopilot in both roll directions. It shall be possible to overpower the autopilot in both directions. The ROLL force indicator (if installed) will indicate the direction of autopilot effort.

12. Lateral Mode Checks:

NOTE Lateral modes (HDG, NAV CAPT or CAP, LRN, LVL, and roll command [autopilot only]) will cancel each other. NAV ARM is not affected by lateral mode switching. Any engaged lateral mode can be disengaged by depressing the mode's selector button.

a. HDG Mode — Check:
  (1) HSI Heading Selector — Set HSI heading bug to present airplane heading.
  (2) HDG Button — Depress. HDG ON annunciator shall illuminate.
  (3) HSI Heading Selector — Rotate left, then right. Control wheel shall follow.
  (4) 1/2 BNK Button — Depress. 1/2 BNK ON annunciator will illuminate.
b. LVL Button — Depress. LVL ON annunciator shall illuminate and the HDG and 1/2 BNK ON annunciators shall go out.
c. NAV Mode (VHF NAV Function) — Check:
  (1) Tune NAV receiver to active VOR frequency and set HSI heading bug to present airplane heading.
  (2) HDG Button — Depress.
  (3) HSI Course Selector — Rotate as required to fully displace HSI course deviation bar in front of airplane symbol.
  (4) NAV Button — Depress. NAV ARM annunciator shall illuminate.

AUTOPILOT OPERATIONAL CHECK (CONT)

(5) HSI Course Selector — Gradually rotate to cause the HSI course deviation bar to move towards the airplane symbol. The NAV ARM and HDG ON annunciators shall go out and the NAV CAPT or CAP annunciator shall illuminate. The autopilot roll axis will respond by moving the control wheel as though to start a turn toward alignment with the course bar.

NOTE: In the event of a weak signal, it may be necessary to depress the NAV receiver Test button to cause NAV CAPT or CAP annunciator to illuminate.

(6) NAV Button — Depress. NAV CAPT or CAP annunciator shall go out.

13. ILS Checks:

NOTE: Ground ILS operational checks require strong ILS signals.

a. Tune NAV receiver to an ILS frequency.
b. NAV Button — Depress. NAV ARM annunciator shall illuminate.
c. BC Button — Depress. BC ON annunciator shall illuminate.
d. G/S Button — Depress. G/S ARM annunciator shall not illuminate and BC ON annunciator shall remain illuminated.
e. BC Button — Depress. BC ON annunciator shall go out.
f. Glideslope check:
    (1) NAV Receiver Test Button — Depress and hold. Then depress G/S button, G/S ARM annunciator shall illuminate.
    (2) NAV Receiver Test Button — Release.
    (3) After HSI glideslope needle centers, NAV Receiver Test Button — Depress and hold. NAV CAPT or CAP, TRK (if applicable), G/S CAPT or CAP, and FNL annunciators shall illuminate.

NOTE: FNL annunciator will not illuminate if radio altimeter is off.

    (4) NAV Receiver Test Button — Release. NAV CAPT or CAP, TRK (if applicable), and G/S CAPT or CAP annunciators shall go out. G/S ARM and NAV ARM annunciators shall illuminate and flash.
    (5) NAV and G/S Buttons — Depress. NAV ARM and G/S ARM annunciators shall go out.

AUTOPILOT OPERATIONAL CHECK (CONT)

14. Vertical Mode Checks:

NOTE

> Pitch modes (IAS, Mach, V/S, G/S CAPT or CAP, ALT SEL CAPT or CAP, ALT HLD, and pitch command [autopilot only] and pitch sync [flight director only]) will cancel each other. G/S ARM and ALT SEL ARM are not affected by pitch mode switching. Any engaged pitch mode, except IAS/Mach hold, can be disengaged by depressing the modes selector button.

a. Speed Mode checks:
   - (1) SPD Button — Depress. IAS annunciator shall illuminate.
   - (2) SPD Button — Depress. Mach annunciator shall illuminate and IAS annunciator shall go out.
   - (3) SPD Button — Depress. IAS annunciator shall illuminate and Mach annunciator shall go out.
   - (4) V/S Button — Depress. V/S ON annunciator shall illuminate and IAS annunciator shall go out.

b. Altitude Mode checks:
   - (1) SFT Button — Depress. SOFT or SFT ON (as applicable) annunciator shall illuminate.
   - (2) Set altitude alerter to approximately 500 feet above field elevation.
   - (3) ALT SEL Button — Depress. ALT SEL ARM annunciator shall illuminate.
   - (4) Using altimeter baro knob, gradually increase indicated altitude to the altitude alerter setting. ALT SEL CAPT or CAP annunciator shall illuminate and the ALT SEL ARM, V/S ON, and SOFT or SFT ON (as applicable) annunciators shall go out. When indicated altitude is within approximately 40 feet of altitude alerter setting, the ALT HLD ON annunciator shall illuminate and the ALT SEL CAPT or CAP annunciator shall go out.
   - (5) ALT HLD Button — Depress. ALT HLD ON annunciator shall go out.
   - (6) ALT HLD Button — Depress. ALT HLD ON annunciator shall illuminate.
   - (7) Reset baro knob to correct altimeter setting.

15. AUTOPILOT Switch — OFF.
16. NAV Receiver — Off.
17. INVERTER Switch(es) — OFF.
18. Battery Switches — OFF.

TO ENGAGE AUTOPILOT

1. AUTOPILOT Switch — On. PWR annunciator will illuminate.
2. ENG Button (autopilot controller) — Depress. Verify that Pitch and Roll annunciators illuminate indicating axes engagement.

NOTE

- Autopilot engagement or disengagement will not affect previously selected modes (except for flight director G/A, refer to AUTOPILOT/FLIGHT DIRECTOR MODES). If SPD (IAS or Mach), V/S, or ALT HLD are selected when the autopilot is engaged, the autopilot and flight director will resync to the values existing at engagement.
- Upon initial engagement, if no flight director modes are selected, the autopilot will automatically assume the attitude hold mode and maintain the attitude existing at the time of engagement if the pitch attitude is between -10° and +20° and the bank angle is less than 30°. If pitch attitude is beyond -10° or +20° when autopilot is engaged, the autopilot will command a pitch change to maintain the aircraft within pitch limits. If the bank angle is between 30° and 35° when the autopilot is engaged, the autopilot will roll to and maintain a 30° bank angle.
- The autopilot will not engage with the PITCH TRIM selector switch in the OFF position.

TO DISENGAGE AUTOPILOT

NOTE Whenever the autopilot pitch and/or roll axes disengage, the applicable Pitch and/or Roll annunciators will go out and the autopilot disengage tone will sound.

- Either Control Wheel Master Switch (MSW), when depressed, will disengage the pitch, roll and yaw axes.
- Either Control Wheel Trim Switch, with arming button depressed and moved in any of the four directions (NOSE UP, NOSE DN, LWD, or RWD), will disengage the pitch and roll axes if either MANUV R/P switch is not depressed.
- AUTOPILOT Switch, when set to OFF, will disengage the pitch and roll axes.
- PITCH TRIM selector switch, when moved to OFF position, will disengage the pitch and roll axes.
- With the PITCH TRIM selector switch in the SEC position, moving the pedestal NOSE DN-OFF-NOSE UP switch to NOSE UP or NOSE DOWN will disengage the pitch and roll axes.
- Individual axes may be disabled by pulling the applicable axis AC or DC circuit breakers (pilot's AC and ess buses).
- Depressing the GO-AROUND button (left thrust lever knob) will disengage the autopilot pitch and roll axes and select flight director G/A and LVL modes.
- VG ERECT button, when depressed, will disengage the autopilot pitch and roll axes.

AUTOPILOT MONITORS

ROLL MONITORS

Two roll monitors are installed. These monitors will disengage the autopilot roll axis if the bank angle exceeds 35° to 40° or if the roll rate exceeds approximately 13.6° per second for more than one-half second. When either monitor disengages the roll axis, the Roll annunciator will go out, the autopilot will disengage, and the disengage tone will sound.

PITCH MONITOR

With the autopilot engaged, the autopilot pitch monitor will cause the elevator to streamline (null servo force) whenever the g level reaches 1.6 g or 0.6 g. The pitch axis does not disengage but will maintain the elevator streamlined. Previously engaged pitch modes will remain engaged. When the aircraft is again within the g limits, the pitch axis will resume elevator inputs.

AUTOPILOT MONITORS (CONT)

PITCH TRIM MONITOR

The autopilot maintains pitch trim using the aircraft's secondary pitch trim actuator. Whenever the autopilot is engaged and secondary trim runs in a direction opposite the elevator servo force, the monitor will disengage the autopilot pitch axis, the Pitch annunciator will go out, the autopilot will disengage and the disengage tone will sound.

OUT-OF-TRIM MONITORS

With the autopilot engaged, the autopilot out-of-trim monitors will cause the applicable Pitch or Roll annunciator to flash should an out-of-trim condition exist such that servo force is continuously applied for more than approximately 30 seconds. The annunciator will continue to flash until trim is restored or the axis is disengaged.

ACCELEROMETER MONITOR *(Aircraft Incorporating SB 35/36-22-7)*

This monitor compares the autopilot accelerometer output with that of a second accelerometer and disengages (or prevents engagement of) the autopilot if a disagreement exists. The monitor has a Built In Test (BIT) to check the monitor's function prior to autopilot use. The BIT check is initiated by depressing and releasing the ENG and BC buttons (autopilot controller) simultaneously with the autopilot engaged. After a 2 to 10 second delay, the Pitch and Roll annunciators will go out and the disengage tone will sound. Test fails if the autopilot does not disengage within the 2 to 10 second time.

AUTOPILOT/STICK NUDGER/STICK PULLER INTERFACE

If the autopilot is engaged and the stick nudger or puller actuates, any selected pitch mode will disengage and the autopilot will maintain a synchronous standby mode until the stick nudger or puller releases. When the stick nudger or puller releases, the autopilot will maintain the existing pitch attitude. If the autopilot is engaged in the glideslope mode with the glideslope captured, and the nudger actuates, the G/S ARM annunciator will flash and the autopilot will maintain a synchronous standby mode. The glideslope may automatically be recaptured after the nudger releases or may be recaptured using a pitch command.

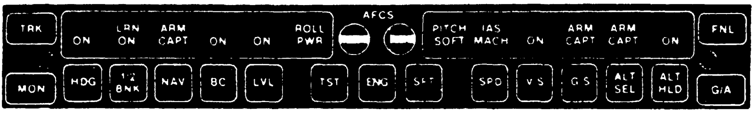
SELF TEST

Self test of the autopilot is initiated by simultaneously depressing and then releasing the ENG and TST buttons on the autopilot controller. The test sequence requires approximately 11 seconds. The test sequence checks: roll and pitch servo and clutch engage circuits; attitude gyro monitor and roll rate gyro; roll monitors; pitch monitor; pitch trim monitor and autopilot release circuits.

When the test is initiated, the MON, Roll, and Pitch annunciators will illuminate. If all tests are passed, the annunciators will go out. The Roll annunciator will go out in approximately 8 seconds and the Pitch annunciator will go out in approximately 11 seconds. If any test fails, the associated axis (Roll or Pitch) annunciator will flash and continue to flash and the MON annunciator will remain illuminated. The pattern of the flashes may be used by maintenance personnel for troubleshooting. The failed axis annunciator will continue to flash and the MON annunciator will remain illuminated until the AUTOPILOT switch is cycled.

If the Control Wheel Master Switch (MSW) is depressed immediately after initiating self test, the Roll and Pitch annunciators will start flashing immediately. This checks the flashing circuit only.

Depressing the TST button alone will illuminate all autopilot controller annunciators. This is a lamp test only.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MON
HDG
1/2 BNK
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SPD
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ALT SEL
ALT HLD
G/A

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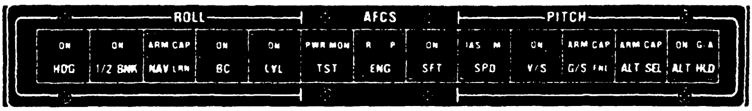
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ON
SFT
IAS M
SPD
ON
V/S
ARM CAP
G/S FNL
ARM CAP
ALT SEL
ON G/A
ALT HLD

Autopilot Controller
Figure 1

AUTOPILOT/FLIGHT DIRECTOR MODES

Autopilot and flight director modes are engaged by depressing the applicable mode selector button on the autopilot controller. Flight director only mode selection is accomplished by depressing the applicable mode selector without the autopilot engaged.

Engaged autopilot and flight director modes may be cancelled by depressing the selector button a second time (except for SPD mode) or selecting an incompatible mode. Incompatible lateral modes are HDG, LRN, NAV CAPT or CAP, LVL, and roll command (autopilot only). NAV ARM is not affected by mode switching. Incompatible pitch modes are SPD, V/S, G/S CAPT or CAP, ALT SEL CAPT or CAP, ALT HLD, pitch command (autopilot only), and pitch sync (flight director only). G/S ARM and ALT SEL ARM are not affected by mode switching.

AUTOPILOT ATTITUDE HOLD

Either the pilot's or copilot's Control Wheel Trim Switch (arming button **not** depressed) may be used to insert autopilot roll and pitch attitude changes. When a pitch attitude change is commanded, previously engaged pitch modes (except G/S ARM and ALT SEL ARM) will disengage. When a roll attitude change is commanded, previously selected roll modes (except NAV ARM) will disengage. When the autopilot is in the attitude hold mode, attitude commands are accepted by the autopilot and the autopilot will hold the attitude, within limits, that exists when the command is released. The typical roll rate of attitude command is approximately 5 degrees per second and the typical pitch rate is approximately 1 degree per second. Attitude command has no effect on flight director only operation.

The autopilot is in pitch attitude hold when the Pitch annunciator is illuminated and all other pitch axis annunciators (except G/S ARM and ALT SEL ARM) are out. The autopilot is in roll attitude hold when the Roll annunciator is illuminated and all other roll axis annunciators (except NAV ARM) are out. When the autopilot is in pitch and roll attitude hold, the flight director command bars will be out of view. Attitude hold authority is limited to 10° nose down and 20° nose up in the pitch axis and 30° left or right bank in the roll axis.

NOTE

Extended autopilot operation in roll attitude hold or LVL will cancel the automatic erection feature of the vertical gyro. As the vertical gyro precesses, the autopilot will bank the aircraft to maintain a zero bank indication on the attitude indicator.

AUTOPILOT/FLIGHT DIRECTOR MODES (CONT)

SFT (Soft)

When SFT is selected, the autopilot provides softer responses in the pitch and roll axes for flying through turbulence. The SFT mode is locked out when in NAV Localizer CAPT or CAP, ALT SEL CAPT or CAP, or VOR Approach. The SOFT or SFT ON (as applicable) annunciator illuminates when the SFT mode is engaged. The autopilot will not maintain reference values as tightly with the SFT mode engaged. SFT mode is not available during flight director only operation.

HDG (Heading)

When HDG is selected, autopilot and/or flight director commands are generated to maneuver the airplane as necessary to fly a heading selected by position of the heading "bug" on the pilot's Horizontal Situation Indicator (HSI). The typical maximum bank angle is 25°. The ON annunciator above the HDG Button will illuminate when heading mode is engaged.

To make a turn of more than 135°, it is recommended that the heading "bug" be set to not more than 135° in the direction of the turn. When the heading "bug" is within approximately 15° of the lubber line, reselect up to 135 additional degrees until the desired heading is obtained.

1/2 BNK (Half Bank)

The 1/2 BNK mode is a subfunction of the HDG or VOR NAV mode and is only functional with HDG or VOR NAV engaged. When HDG or VOR NAV and 1/2 BNK are engaged the typical maximum bank angle is 13°. The ON annunciator above the 1/2 BNK Button will illuminate when 1/2 BNK is engaged. The 1/2 BNK mode can be used for VOR capture but not for LRN operations.

NAV (Navigation)

VHF NAV Function: VHF NAV is a subfunction of NAV mode. When VHF NAV is selected, the autopilot and/or flight director function which captures and tracks VOR and LOC is activated. For VHF NAV mode to function, the aircraft NAV receiver must be tuned to the frequency of the navigation aid and the HSI course selector must be set to the desired course. Any mode may be used to intercept the course. Activation of the VHF NAV mode will start automatic procedures and the NAV ARM annunciator will illuminate. When the aircraft turns on the desired track, the NAV ARM annunciator will go out and the NAV CAPT or CAP annunciator will illuminate. Refer to VOR OPERATION, ILS APPROACH, and BACKCOURSE LOCALIZER APPROACH.

AUTOPILOT/FLIGHT DIRECTOR MODES (CONT)

LRN (Long Range Navigation) Function: LRN is a subfunction of NAV mode. When LRN is selected, the autopilot and/or flight director function which follows steering commands generated by the installed LRN device is activated. For LRN mode to function, a valid NAV course must be programed on the LRN device CDU and the LRN device selected for display on the HSI. When properly initialized, LRN is selected by depressing the NAV button. When LRN is selected, automatic autopilot and/or flight director course interception and tracking procedures will begin and the LRN annunciator will illuminate. If the aircraft is not on course when LRN is selected, the autopilot and/or flight director will maneuver as required to intercept the desired course. The maximum intercept angle is approximately 45°. Refer to LRN OPERATION.

TRK (Track) (if applicable)

In the NAV CAPT mode, the TRK annunciator illuminates to indicate that the autopilot and/or flight director is approaching the center of the VOR or LOC beam. Crosswind compensation begins when TRK annunciator is illuminated. Refer to VOR OPERATION, ILS APPROACH, and BACK-COURSE LOCALIZER APPROACH.

BC (Back Course)

For BC mode operation, the NAV mode must be engaged and the primary NAV receiver must be tuned to a localizer frequency. When the BC button is depressed, the BC ON annunciator illuminates, the course information to the autopilot and/or flight director is reversed, and the glideslope signal is locked out. Disengaging the NAV mode also disengages BC. Refer to BACK-COURSE LOCALIZER APPROACH.

LVL (Level)

When the LVL mode is engaged, the autopilot and/or flight director will roll to and maintain a wings level attitude as defined by the attitude indicator. The LVL ON annunciator will illuminate when LVL mode is engaged.

NOTE

- Extended autopilot operation in LVL or roll attitude hold will cancel the automatic erection feature of the vertical gyro. As the vertical gyro precesses, the autopilot will bank the aircraft to maintain a zero bank indication on the attitude indicator.
- If a pitch mode is engaged with no lateral mode selected during flight director only operation, the LVL mode will automatically engage, the LVL ON annunciator will illuminate, and the flight director command bars will provide a wings level command.

AUTOPILOT/FLIGHT DIRECTOR MODES (CONT)

ALT SEL (Altitude Select)

The desired altitude is set using the altitude alerter on the instrument panel. When the ALT SEL button is depressed, the mode is armed and the ALT SEL ARM annunciator will illuminate. While in ARM, any pitch mode may be used to climb or descend to the selected altitude. Upon nearing the selected altitude, the pitch mode in use disengages, ALT SEL ARM mode switches to ALT SEL CAPT or CAP mode and the autopilot and/or flight director begins a flare maneuver, leveling off at the altitude selected on the altitude alerter. The point at which the flare maneuver begins depends upon aircraft vertical speed. When the aircraft is within approximately 40 feet of the selected altitude and the aircraft vertical speed is within limits, ALT HLD mode will automatically engage — ALT HLD ON annunciator will illuminate and ALT SEL CAPT or CAP annunciator will go out.

NOTE

- Selecting a new altitude on the altitude alerter when in ALT SEL CAPT or CAP will cancel ALT SEL, the ALT SEL CAPT or CAP annunciator will go out, and the autopilot and/or flight director will revert to pitch attitude hold. Selecting a new altitude when in ALT SEL ARM or ALT HLD will have no effect.
- ALT SEL cannot be armed when the aircraft is past the capture point.
- After level off at the selected altitude, ALT SEL cannot be armed again if the aircraft deviates more than 300 feet from the selected altitude (altitude alert light will be illuminated). If it is desired to use ALT SEL after departure from the selected altitude, the desired altitude must be reset on the altitude alerter even if the desired altitude has not changed.

ALT HLD (Altitude Hold)

When ALT HLD is selected, the autopilot and/or flight director will maintain the existing pressure altitude. The ALT HLD ON annunciator illuminates when ALT HLD is selected. For smoothest 'leveling off', the rate of climb or descent should be less than 1000 feet per minute. ALT HLD is automatically engaged after ALT SEL CAPT or CAP (refer to ALT SEL mode description).

AUTOPILOT/FLIGHT DIRECTOR MODES (CONT)

SPD (Speed)

When SPD is selected, the autopilot and/or flight director pitch axis is coupled to an air data sensor output to maintain speed existing at the time of engagement. When the SPD Button is first depressed the IAS annunciator will illuminate and the aircraft will hold the existing airspeed. Depressing the SPD button a second time will disengage IAS, the Mach annunciator will illuminate, and the aircraft will hold the existing Mach number. The switch will toggle between IAS and Mach, always starting with IAS upon initial engagement. Speed is maintained by the autopilot by changing pitch attitude as necessary. Power must be set by the pilot.

V/S (Vertical Speed)

When V/S is selected, the autopilot and/or flight director will hold an established rate of climb or descent. Before engaging this mode, maintain the desired rate long enough (approximately 15 seconds) for vertical speed indicator lag to diminish. The V/S ON annunciator illuminates when V/S is selected.

G/S (Glideslope)

The G/S mode, when selected, activates the autopilot and/or flight director function which captures and tracks glideslope. For G/S to function, the primary NAV receiver must be tuned to a localizer frequency, an active glideslope signal must be present, and BC mode must not be engaged. If the aircraft is not on the glideslope when G/S is selected, the G/S ARM annunciator will illuminate and the engaged pitch mode will be maintained. As the aircraft nears the center of the glideslope, the G/S ARM annunciator will go out, the engaged pitch mode will disengage, the G/S CAPT or CAP annunciator will illuminate, and the autopilot and/or flight director will intercept and track the glideslope. If G/S is selected while the aircraft is on the glideslope, G/S CAPT or CAP will be immediate. Refer to ILS APPROACH.

FNL (Final)

The FNL annunciator will illuminate during an ILS or backcourse localizer approach whenever the beam signal is being desensitized. Signal desensitizing is activated at approximately 1000 feet AGL if a valid radio altimeter signal is available. If a valid radio altimeter signal is not

AUTOPILOT/FLIGHT DIRECTOR MODES (CONT)

available, signal desensitizing can be activated by outer marker passage or momentarily depressing the primary NAV TEST button.

NOTE To activate by outer marker passage or NAV TEST button, flaps must be 8° or lower. Illumination of the FNL annunciator is immediate when activated by radio altimeter signal, but delayed approximately 12 seconds if activated by outer marker passage or NAV TEST.

Refer to ILS APPROACH or BACKCOURSE LOCALIZER APPROACH.

G/A (Go-Around)

Go-Around is a flight director only mode. Depressing the GO-AROUND button on the left thrust lever knob disengages the autopilot (if engaged), illuminates the G/A and LVL ON annunciators and commands pilot's flight director to 9° pitch up and wings level attitude. If the autopilot is engaged while in the flight director G/A mode, the G/A annunciator will go out and the autopilot pitch axis will engage and maintain the pitch attitude existing at engagement.

MANUV R/P SWITCH

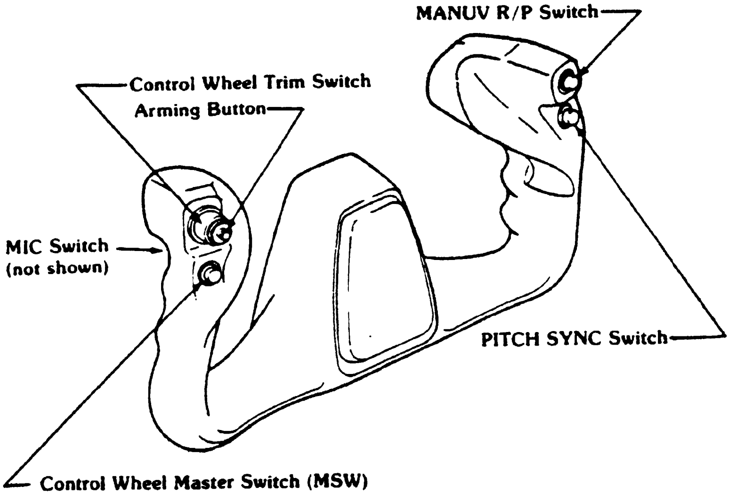
Depressing either the pilot's or copilot's control wheel MANUV R/P switch, will temporarily inhibit the autopilot pitch and roll axes and extinguish the Pitch and Roll annunciators. Manual pitch, roll, and trim commands can be made while the switch is depressed. Selected roll and pitch modes will not disengage when the switch is depressed. When the switch is released, the autopilot will resynchronize to and hold the existing (new) values in SPD (IAS or Mach), V/S, or ALT HLD modes. If MANUV R/P switch is released beyond autopilot roll monitor limits, the roll axis will disengage, the Roll annunciator will go out, the autopilot will disengage, and the disengage tone will sound.

The pilot's MANUV R/P Switch may be used to stow the pilot's flight director command bars during flight director only operation.

PILOT'S PITCH SYNC SWITCH

During flight director only operation, depressing the pilot's PITCH SYNC switch will disengage any engaged pitch modes except G/S ARM and ALT SEL ARM. If a lateral mode is engaged, flight director pitch attitude hold reference values may be changed by depressing the pilot's PITCH SYNC switch. The pilot's flight director command bars will maintain the pitch attitude existing when the PITCH SYNC switch is released.

The pilot's PITCH SYNC switch has no effect on autopilot operation.



Pilot's Control Wheel Switches
Figure 2

PILOT'S FLIGHT DIRECTOR

The pilot's flight director indicators have been integrated with the autopilot and receive signals from the autopilot computer. With the autopilot engaged, the flight director indicators may be used to monitor autopilot functions. With the autopilot not engaged (PWR annunciator illuminated and Pitch and Roll annunciators out), the flight director indicators may be used to manually fly the aircraft in response to flight director steering commands.

NOTE Refer to the applicable Flight Manual Supplement for Pilot's Flight Director Indicators Integrated with J.E.T. FC-530 Autopilot for specific information regarding the installed pilot's flight director indicators.

TO OBTAIN FLIGHT DIRECTOR ONLY OPERATION

1. AUTOPILOT Switch — ON. PWR annunciator will illuminate and flight director indicators will receive signals from the autopilot computer.
2. The autopilot controller provides mode switching and annunciation for the flight director while the autopilot is disengaged.

PILOT'S FLIGHT DIRECTOR (CONT)

FLIGHT DIRECTOR MODES

During flight director only operation, available modes and mode switching is as described under AUTOPILOT/FLIGHT DIRECTOR MODES in this Supplement.

NOTE

- If a pitch mode is engaged with no lateral mode selected, the LVL mode will automatically engage, the LVL ON annunciator will illuminate, and the pilot's flight director command bars will display the desired pitch and wings level command.
- All selected flight director mode may be cancelled by depressing the pilot's MANUV R/P Switch.

LRN OPERATION

The LRN mode is used to intercept and track a course set on the Control Display Unit (CDU) of a Long Range Navigation (LRN) System. To establish the aircraft on an LRN course, the following procedure may be used:

1. Program the desired course on the Control Display Unit (CDU).
2. For Horizontal Situation Indicator (HSI) without remote slew capability, set in the desired course using the course selector.

NOTE

Since LRN mode utilizes composite roll steering instead of right/left deviation, setting the course on the HSI is not a requirement. However, to properly orient the HSI deviation display, the course should be set.

3. HSI Display Selector Switch — Select LRN device.

NOTE

- LRN device cannot be selected if a localizer frequency is tuned on the NAV 1 receiver.
- 1/2 BANK mode cannot be selected during LRN operation.

4. NAV Button (autopilot controller) — Depress. The LRN annunciator will illuminate to indicate the LRN mode is engaged.

LRN OPERATION (CONT)

If the aircraft is on course when LRN is selected, autopilot and/or flight director steering will maintain the aircraft on course. If the aircraft is not on course when LRN is selected, autopilot and/or flight director steering will be provided for an approximate 45° course intercept and eventual course tracking. The TRK annunciator (if applicable) is not functional in the LRN mode.

NOTE

- Upon failure of LRN validity, LRN will disengage (LRN annunciator will flash), the autopilot and/or flight director will automatically assume roll attitude hold, and the HSI display selector switch will revert to VHF NAV. Upon return of LRN validity, the LRN device must be reselected and the NAV button (autopilot controller) must be depressed for continued LRN operation.
- If a localizer frequency is selected on the NAV 1 receiver while in the LRN mode, LRN will disengage (LRN annunciator will go out), the HSI display selector switch will revert to VHF NAV, the HSI will display localizer information, and the autopilot and/or flight director will automatically assume roll attitude hold.

VOR OPERATION

The NAV mode is used to capture and track VOR radials. To establish the aircraft on a desired VOR course, the following procedure can be used:

1. Tune NAV receiver to desired VOR frequency.
2. Using the course selector, set the desired course on the Horizontal Situation Indicator (HSI).
3. Establish the desired intercept heading. Any mode may be used to establish the heading and the intercept can be accomplished at any intercept angle.
4. NAV Button (autopilot controller) — Depress. NAV ARM annunciator will illuminate to indicate the autopilot and/or flight director is armed for VOR capture.

NOTE

Changing roll modes while in NAV ARM will have no effect on NAV mode. Changing roll modes after NAV CAPT or CAP annunciator illuminates will disengage NAV mode.

As the aircraft nears the radial, the NAV ARM annunciator will go out, any engaged roll mode annunciators will go out, and the NAV CAPT or CAP annunciator will illuminate. The autopilot and/or flight director will maneuver as required to intercept the VOR radial.

As the aircraft moves on track, the TRK annunciator (if applicable) will illuminate to indicate the autopilot and/or flight director is tracking the VOR signal. When the TRK annunciator (if applicable) illuminates the autopilot and/or flight director will begin to compute the required wind drift correction angle and the maximum bank angle will be limited to 15° maximum.

DME information, if available, is used to improve VOR intercepts, tracking and station passage. Normally, DME should be selected for the NAV 1 position. The autopilot will use VOR beam rate and performance will be slightly degraded if; (1) the primary DME should fail, (2) the primary DME frequency selector is in the HOLD or NAV 2 (if installed) position or (3) a separate DME frequency tuning head is installed on the primary DME.

NOTE

Should the VOR signal become noisy or fail, the system will automatically hold a heading equal to the selected course plus the computed wind drift correction angle. The TRK (if applicable) and NAV CAPT or CAP annunciators will go out and the NAV ARM annunciator will flash. Approximately 20 seconds (flaps UP) or 5 seconds (flaps 8° or more) after the signal becomes usable again, the flashing NAV ARM annunciator will go out, and the TRK (if applicable) and NAV CAPT or CAP annunciators will illuminate.

VOR OPERATION (CONT)

During overstation passage, the autopilot and/or flight director will hold a heading equal to the selected course plus the computed wind drift correction angle. The TRK (if applicable) and NAV CAPT or CAP annunciators will go out and the NAV ARM annunciator will flash. The desired outbound course may be selected any time after the NAV ARM annunciator starts flashing and the autopilot and/or flight director will turn to and hold a heading equal to the selected outbound course plus the computed wind drift correction. Upon exiting the overstation passage mode, the TRK (if applicable) and NAV CAPT or CAP annunciators will illuminate and the autopilot and/or flight director will reintercept and track the selected outbound course. If DME information is available, it is used to enter and exit the overstation passage mode as a function of Mach number. At 0.75 M_I, overstation passage will occur at approximately 15 nautical miles. If DME information is not available, the overstation passage mode is entered by the noisy signal close to the VOR station.

VOR APPROACH

For a VOR approach, autopilot and/or flight director operation and overstation passage are as described in the preceding paragraphs entitled VOR OPERATION.

NOTE

- The flaps must be lowered to 8° or more prior to intercepting the VOR radial inbound to the final approach fix. When the flaps are lowered 8° or more, the autopilot and/or flight director will automatically switch to an approach mode and increase the autopilot and/or flight director sensitivity to course deviations.
- SFT mode is locked out during autopilot coupled VOR approaches.

ILS APPROACH

During an ILS front-course approach, the localizer and glideslope are independently captured. The NAV mode is used to capture and track the localizer and the G/S mode is used to capture and track the glideslope. The following procedure can be used to perform a front-course ILS approach:

1. Tune the NAV receiver to the desired ILS frequency.
2. Using the course selector, set the course on the Horizontal Situation Indicator (HSI) to the published inbound course.
3. Establish desired intercept heading. Any mode may be used to establish the intercept heading.

NOTE

- **The localizer should be intercepted at an angle less than 90°.**
- **The inbound localizer course should be established outside the outer marker.**

4. NAV Button (autopilot controller) — Depress. NAV ARM annunciator will illuminate to indicate the autopilot and/or flight director is armed for localizer capture.

NOTE

Changing roll modes while in NAV ARM will have no effect on NAV mode. Changing roll modes after the NAV CAPT or CAP annunciator illuminates will disengage NAV mode.

5. When a valid glideslope signal is received, G/S Button (autopilot controller) — Depress. G/S ARM annunciator will illuminate to indicate the autopilot and/or flight director is armed for glideslope capture.

NOTE

Changing pitch modes while in G/S ARM will have no effect on G/S mode. Changing pitch modes after the G/S CAPT or CAP annunciator illuminates will disengage G/S mode.

As the aircraft nears the center of the localizer, the NAV ARM annunciator will go out, any engaged roll mode annunciator will go out, and the NAV CAPT or CAP annunciator will illuminate. The autopilot and/or flight director will maneuver as required to intercept the localizer.

When the aircraft moves on track, the TRK annunciator (if applicable) will illuminate to indicate the autopilot and/or flight director is tracking the localizer. When the TRK annunciator (if applicable) illuminates, the autopilot and/or flight director will begin to compute the required wind drift correction angle.

ILS APPROACH (CONT)

NOTE

Should the localizer signal become noisy or fail, the autopilot and/or flight director will automatically hold a heading equal to the selected course plus the computed wind drift correction angle, the TRK (if applicable) and NAV CAPT or CAP annunciators will go out, and the NAV ARM annunciator will flash. When the signal becomes usable again, the flashing NAV ARM annunciator will go out and the TRK (if applicable) and NAV CAPT or CAP annunciators will illuminate.

As the aircraft nears center of the glideslope, the G/S ARM annunciator will go out, any engaged pitch mode annunciator will go out, and the G/S CAPT or CAP annunciator will illuminate. The autopilot and/or flight director will maneuver as required to intercept and track the glideslope.

NOTE

If the stick nudger actuates during an ILS approach in heavy turbulence, G/S will disengage. Refer to AUTOPILOT/STICK NUDGER/STICK PULLER INTERFACE.

When on final approach, check that the FNL annunciator illuminates to indicate that the localizer and glideslope gains are being desensitized for close-in stability. If the radio altimeter signal is valid, the FNL light will illuminate at approximately 1000 feet AGL. If the radio altimeter signal is not valid, the FNL light will illuminate when passing over the outer marker.

NOTE

- If radio altimeter and outer marker are not available, depressing the primary NAV TEST button momentarily will illuminate the OM light and, after a short delay, illuminate the FNL light. This should be accomplished at the final approach fix.
- If using BC mode to fly outbound on the localizer and radio altimeter information is not available, flight over the outer marker will illuminate the FNL annunciator and localizer desensitizing will begin. If this occurs, disengaging NAV mode and then re-engaging NAV mode will cancel localizer desensitizing.

6. Disengage autopilot at or above 200 feet AGL.

BACK-COURSE LOCALIZER APPROACH

As in an ILS front-course approach, the NAV mode is used to capture and track the localizer. However, when back-course (BC) is selected, glideslope (G/S) arming and capture modes are locked out. The following procedure can be used to perform a back-course localizer approach:

1. Tune the NAV receiver to the desired LOC frequency.
2. Using the course selector, set the course on the Horizontal Situation Indicator (HSI) to the published inbound (front) course.
3. Establish desired intercept heading. Any mode may be used to establish the intercept heading.
4. NAV Button (autopilot controller) — Depress. NAV ARM annunciator will illuminate to indicate the autopilot and/or flight director is armed for localizer capture.
5. BC Button (autopilot controller) — Depress. BC ON annunciator will illuminate to indicate that the autopilot and/or flight director is armed for back-course localizer capture.

NOTE

Changing roll modes while in NAV ARM will have no effect on NAV and BC modes. Changing roll modes after the NAV CAPT or CAP annunciator illuminates will disengage NAV and BC modes.

As the aircraft nears the center of the localizer, the NAV ARM annunciator will go out, any engaged lateral mode annunciator will go out, the NAV CAPT or CAP annunciator will illuminate, and the BC ON annunciator will remain illuminated. The autopilot and/or flight director will maneuver as required to intercept the localizer.

When the aircraft moves on track, the TRK annunciator (if applicable) will illuminate to indicate the autopilot and/or flight director is tracking the localizer signal. When the TRK annunciator (if applicable) illuminates, the autopilot and/or flight director will begin to compute the required wind drift correction angle.

NOTE

Should the localizer signal become noisy or fail, the autopilot and/or flight director will automatically hold a heading equal to the selected course plus the computed wind drift correction angle, the TRK (if applicable) and NAV CAPT or CAP annunciator will go out, and the NAV ARM annunciator will flash. When the signal becomes usable again, the flashing NAV ARM annunciator will go out and the TRK (if applicable) and NAV CAPT or CAP annunciators will illuminate.

BACK-COURSE LOCALIZER APPROACH (CONT)

If the radio altimeter signal is valid, when the aircraft is approximately 1000 feet AGL, the FNL annunciator will illuminate to indicate the localizer gain is being desensitized for close-in stability.

NOTE

If radio altimeter and outer marker are not available, depressing the primary NAV TEST button momentarily will illuminate the OM light and, after a short delay, illuminate the FNL light. This should be accomplished at the final approach fix.

SECTION III – EMERGENCY PROCEDURES

AUTOPILOT MALFUNCTION

Refer to PITCH AXIS MALFUNCTION and ROLL OR YAW AXIS MALFUNCTION procedures, AFM Section III.

NOTE

Maximum altitude losses during autopilot malfunction are:

• Cruise	600 feet
• ILS	100 feet

ENGINE FAILURE ON COUPLED APPROACH

1. Control Wheel Master Switch (MSW) — Depress.
2. Thrust Lever (operative engine) — Increase as required.
3. Flaps — 20° maximum.
4. Airspeed — V_{REF} + 10 minimum.
5. Retrim aircraft.

NOTE

Full rudder trim may be required with an actual engine failure. Use rudder pedal force as necessary to maintain slip indicator ball centered.

6. Yaw Damper — Reengage.
7. Refer to ENGINE SHUTDOWN IN FLIGHT, AFM Section III.
8. Autopilot — Reengage, if desired.
9. At decision height, Autopilot — Disengage.
10. Flaps — 40°, V_{REF}.

SECTION IV – ABNORMAL PROCEDURES

COUPLED APPROACH WITH SPOILERONS INOPERATIVE

1. Flaps — 20° maximum.
2. Airspeed — V_{REF} + 10 minimum.
3. At decision height, Autopilot — Disengage.
4. Flaps — 40°, V_{REF}.

SECTION V – PERFORMANCE

No change from FAA Approved Airplane Flight Manual.

Learjet 35A & 36A
with
FC-530 Autopilot

WEIGHT AND BALANCE DATA

MODEL 35A SERIAL NO. ______________________________

MODEL 36A SERIAL NO. ______________________________

DATE______________________________

LIST OF EFFECTIVE PAGES

WEIGHT AND BALANCE DATA

Dates of issue for Original and Changed pages are:

Original	O	5-13-1983
Change	1	8-15-1984
Change	2	9-5-2006

Page	Change
* Title	2
* WB-A	2
WB-i	O
WB-ii	O
WB-1 thru WB-5	O
WB-6 thru WB-8	1
WB-9 thru WB-17	O
* WB-18	2
WB-19 thru WB-42	O

* Indicates pages changed, added or deleted by the current change. Insert latest changed pages; destroy superseded pages.

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Dimensional Data (Figure 3, 2 Sheets)
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  Dimensional Data — Model 36A (Sheet 2) WB-5
Loading Instructions WB-6
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WEIGHT AND BALANCE DATA

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BASIC EMPTY WEIGHT ____________________
(Includes Unusable Fuel and Full Operating Fluids)

C.G. ____________________

MOMENT ____________________

It is the responsibility of the aircraft owner and pilot to ensure that the aircraft is loaded properly. The basic empty weight and center of gravity noted are for the aircraft as delivered from the factory. In the event the aircraft is altered, refer to the Aircraft Records.

Owners are advised to contact the aircraft manufacturer when any change is made to the aircraft which would appreciably affect the location of useful load items.

WEIGHT AND CENTER OF GRAVITY LIMITS

NOTE

- The Normal Empty Weight Center of Gravity may be aft of the Flight Limit.
- For Fuel Used vs. Moment Loss (For Flight Planning), refer to figure 9.

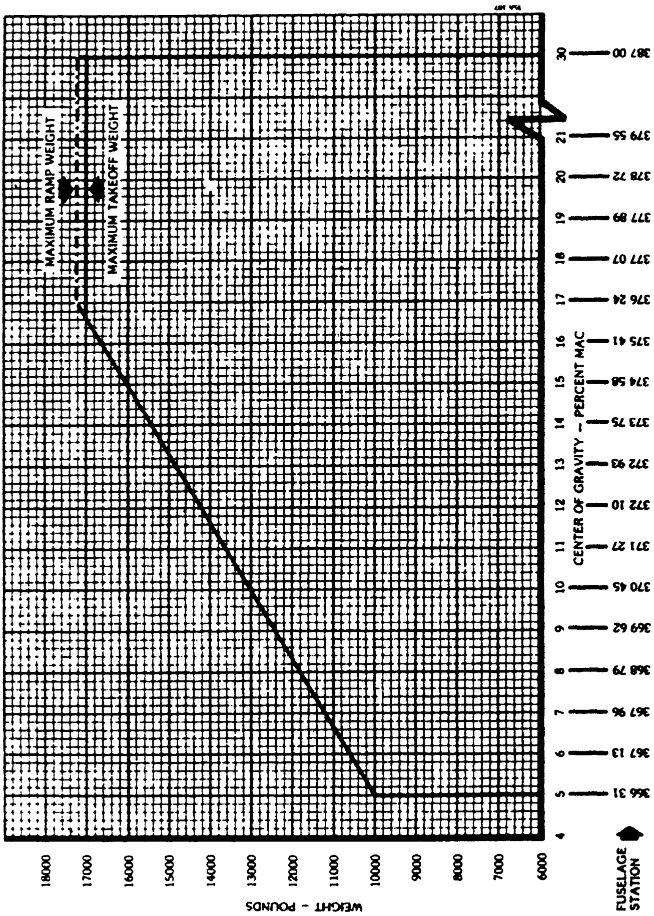
MODEL 35A STANDARD.

The Forward C.G. Limit is 5% MAC for all weights up to and including 10,000 pounds and tapers through 16.66% at 17,000 pounds (Maximum Certified Takeoff Weight) to 17.09% at 17,250 pounds (Maximum Ramp Weight). The Aft C.G. Limit is 30% for all weights. Refer to Figure 1.

MODEL 35A OPTIONAL AND MODEL 36A STANDARD.

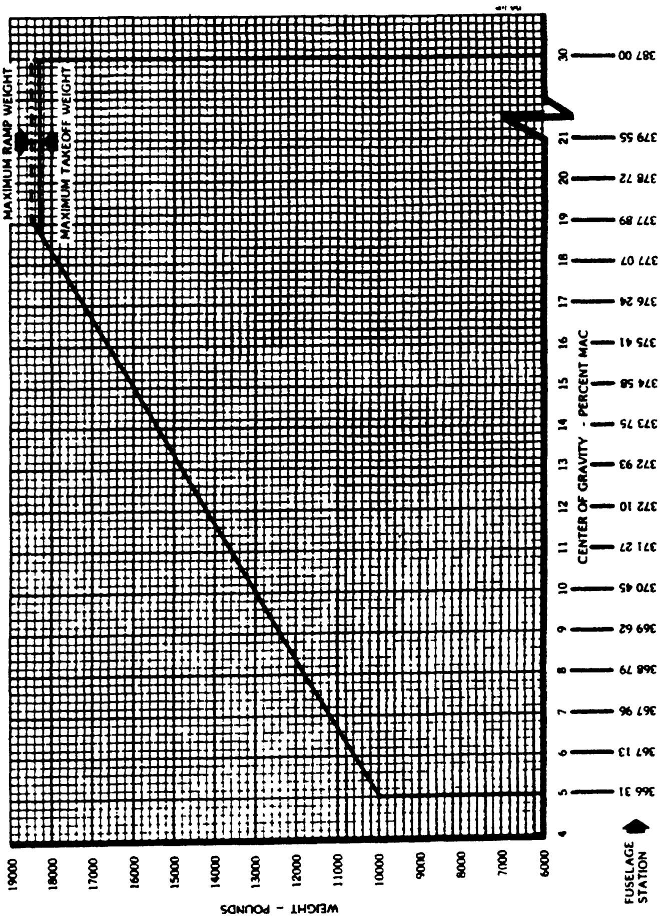
The Forward C.G. Limit is 5% for all weights up to and including 10,000 pounds and tapers through 18.83% at 18,300 pounds (Maximum Certified Takeoff Weight) to 19.17% at 18,500 pounds (Maximum Ramp Weight). The Aft C.G. Limit is 30% for all weights. Refer to Figure 2.

FLIGHT ENVELOPE



Aircraft certified for 17,000 pounds Takeoff Weight
Figure 1

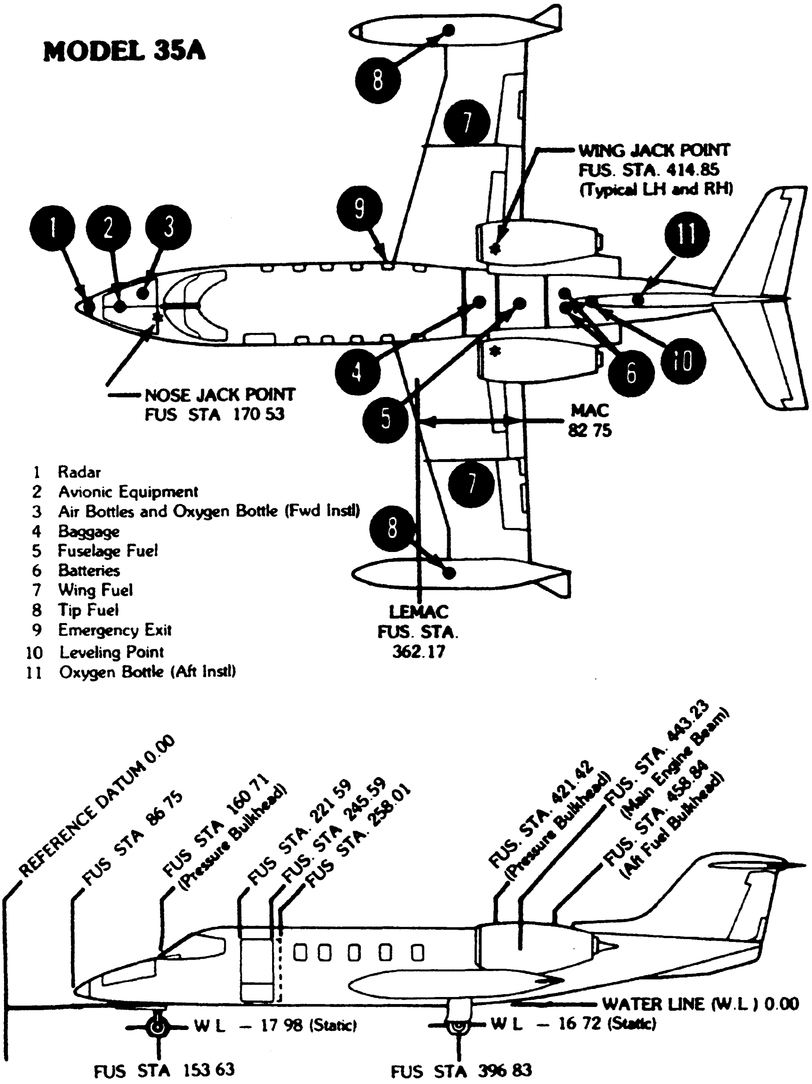
FLIGHT ENVELOPE



Aircraft certified for 18,300 pounds Takeoff Weight
Figure 2

DIMENSIONAL DATA

MODEL 35A

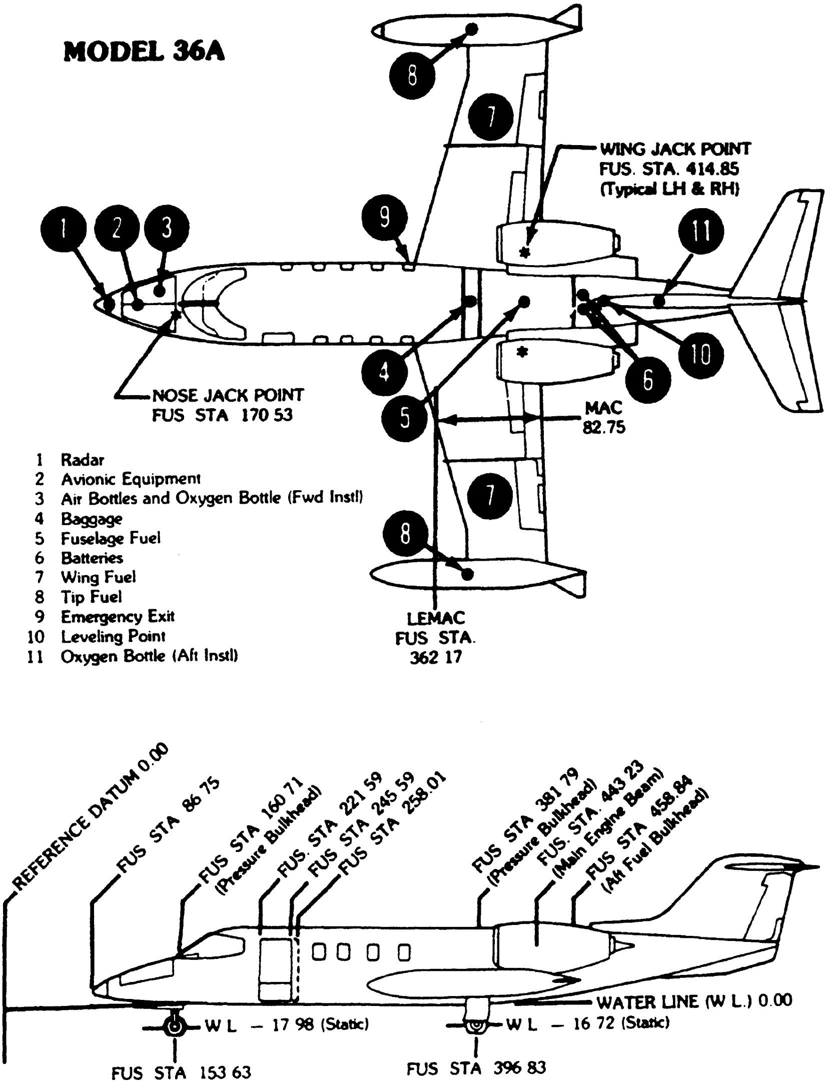

1
2
3
4
5
6
7
8
9
10
11
WING JACK POINT
FUS. STA. 414.85
(Typical LH and RH)
NOSE JACK POINT
FUS STA 170 53
MAC
82 75
LEMAC
FUS. STA.
362.17
REFERENCE DATUM 0.00
FUS STA 86 75
FUS STA 160 71 (Pressure Bulkhead)
FUS STA. 221 59
FUS STA 245.59
FUS STA. 258.01
FUS. STA. 421.42 (Pressure Bulkhead)
FUS. STA. 443.23 (Main Engine Beam)
FUS. STA. 458.84 (Aft Fuel Bulkhead)
WATER LINE (W.L.) 0.00
W L — 17 98 (Static)
W L — 16 72 (Static)
FUS STA 153 63
FUS STA 396 83

1	Radar
2	Avionic Equipment
3	Air Bottles and Oxygen Bottle (Fwd Instl)
4	Baggage
5	Fuselage Fuel
6	Batteries
7	Wing Fuel
8	Tip Fuel
9	Emergency Exit
10	Leveling Point
11	Oxygen Bottle (Aft Instl)

Figure 3 (Sheet 1 of 2)

DIMENSIONAL DATA

MODEL 36A


8
7
WING JACK POINT
FUS. STA. 414.85
(Typical LH & RH)
1
2
3
9
11
4
5
10
6
NOSE JACK POINT
FUS STA 170 53
MAC
82.75
7
8
LEMAC
FUS STA.
362 17
REFERENCE DATUM 0.00
FUS STA 86 75
FUS STA 160 71
(Pressure Bulkhead)
FUS. STA 221 59
FUS STA 245 59
FUS STA 258.01
FUS STA 381 79
(Pressure Bulkhead)
FUS. STA. 443 23
(Main Engine Beam)
FUS STA 458.84
(Aft Fuel Bulkhead)
WATER LINE (W L.) 0.00
W L — 17 98 (Static)
W L — 16 72 (Static)
FUS STA 153 63
FUS STA 396 83

1 Radar
2 Avionic Equipment
3 Air Bottles and Oxygen Bottle (Fwd Instl)
4 Baggage
5 Fuselage Fuel
6 Batteries
7 Wing Fuel
8 Tip Fuel
9 Emergency Exit
10 Leveling Point
11 Oxygen Bottle (Aft Instl)

Figure 3 (Sheet 2 of 2)

LOADING INSTRUCTIONS

It is the responsibility of the pilot to see that this aircraft is loaded within the weight and C.G. limits. The loading forms (figure 4) may be used.

1. Enter the BASIC EMPTY WEIGHT and MOMENT from page WB-1 or; in the event the airplane has been altered, enter the BASIC EMPTY WEIGHT and MOMENT from the Aircraft Records.
2. Enter the payload weights and moments (crew, passengers, provisions, baggage, etc.) using the Payload Moments Charts, figure 11.
3. Enter the fuel weights and moments using the Fuel Moments Charts, figure 7.
4. Compute the ZERO FUEL WEIGHT and MOMENT (OPERATING WEIGHT values plus Passenger and Baggage values).
5. Compute ZERO WING & TIP FUEL WEIGHT (ZERO FUEL WEIGHT value plus fuselage tank fuel weight).
6. Compute RAMP WEIGHT and MOMENT (ZERO FUEL WEIGHT values plus fuel values).
7. Compute TAKEOFF WEIGHT and MOMENT (RAMP WEIGHT values minus Taxi Burnoff out of tips).
8. Compare TAKEOFF WEIGHT and MOMENT with weight and C.G. limits from Weight-Moment-C.G. Envelope, figure 5, or Center-of-Gravity Table, figure 6. If not within limits, reduce weight or rearrange load as required to obtain weight and C.G. within limits.
9. LANDING WEIGHT and MOMENT may be calculated by subtracting the fuel used weight and moment from the TAKEOFF WEIGHT and MOMENT.
10. The formula to calculate the C.G. in % MAC is:

$$\text{C.G. in \% MAC} = \left[\frac{\text{Fuselage Station (Center of Gravity)} - 362.17}{82.75}\right] \times 100$$

AIRCRAFT LOADING FORM

Interior Configuration________________________________

MODEL 35A	WEIGHT	F.S.	MOM/1000	% MAC
BASIC EMPTY WEIGHT				
Missing/Additional Equipment				—
Crew				—
Provisions — Fwd				—
Provisions — Mid				—
Provisions — Aft				—
Provisions — Toilet				—
Water				—
Miscellaneous				—
				—
OPERATING WEIGHT EMPTY				
Baggage — Fwd				—
Baggage — Aft				—
Passenger — Fwd Sidefacing				—
Passengers — Fwd Swivel				—
Passengers — Aft Swivel				—
Passengers — Divan				—
				—
				—
				—
ZERO FUEL WEIGHT				
Fuselage Tank				—
ZERO WING & TIP FUEL WEIGHT		—	—	—
Wing Tanks				—
Tip Tanks				—
RAMP WEIGHT				
*Taxi Burnoff Out of Tips				—
TAKEOFF WEIGHT				
Fuel Used — Tips				—
— Wings				—
— Fuselage				—
LANDING WEIGHT				

*Fuel burnoff is approximately 3.5 pounds per engine per minute.

Figure 4 (Sheet 1 of 2)

AIRCRAFT LOADING FORM

Interior Configuration____

MODEL 36A	WEIGHT	F.S.	MOM/1000	% MAC
BASIC EMPTY WEIGHT				
Missing/Additional Equipment				—
Crew				—
Provisions — Fwd				—
Provisions — Aft				—
Provisions — Toilet				—
Water				—
Miscellaneous				—
				—
OPERATING WEIGHT EMPTY				
Baggage — Fwd				—
Baggage — Aft				—
Passenger — Fwd Swivel — LH				—
— RH				—
Passengers — Divan				—
				—
				—
				—
ZERO FUEL WEIGHT				
Fuselage Tank				—
ZERO WING & TIP FUEL WEIGHT		—	—	—
Wing Tanks				—
Tip Tanks				—
RAMP WEIGHT				
*Taxi Burnoff Out of Tips				—
TAKEOFF WEIGHT				
Fuel Used — Tips				—
— Wings				—
— Fuselage				—
LANDING WEIGHT				

*Fuel burnoff is approximately 3.5 pounds per engine per minute

Figure 4 (Sheet 2 of 2)

ENVELOPE BASED ON THE FOLLOWING WEIGHT AND CENTER-OF-GRAVITY LIMIT DATA (Landing Gear Down)

WEIGHT CONDITION	FWD C.G. LIMIT	AFT C.G. LIMIT
10,000 lb or less	5% MAC	30% MAC
14,300 lb (Max. Landing)	12.17% MAC	30% MAC
15,300 lb (Max. Landing)	13.84% MAC	30% MAC
17,000 lb (Max. Takeoff)	16.66% MAC	30% MAC
18,000 lb (Max. Takeoff)	18.33% MAC	30% MAC
18,300 lb (Max. Takeoff)	18.83% MAC	30% MAC
17,250 lb (Max. Ramp)	17.09% MAC	30% MAC
18,250 lb (Max. Ramp)	18.76% MAC	30% MAC
18,500 lb (Max. Ramp)	19.17% MAC	30% MAC

NOTE: LANDING GEAR RETRACTION MOMENT (MINUS) 2437 INCH-POUNDS

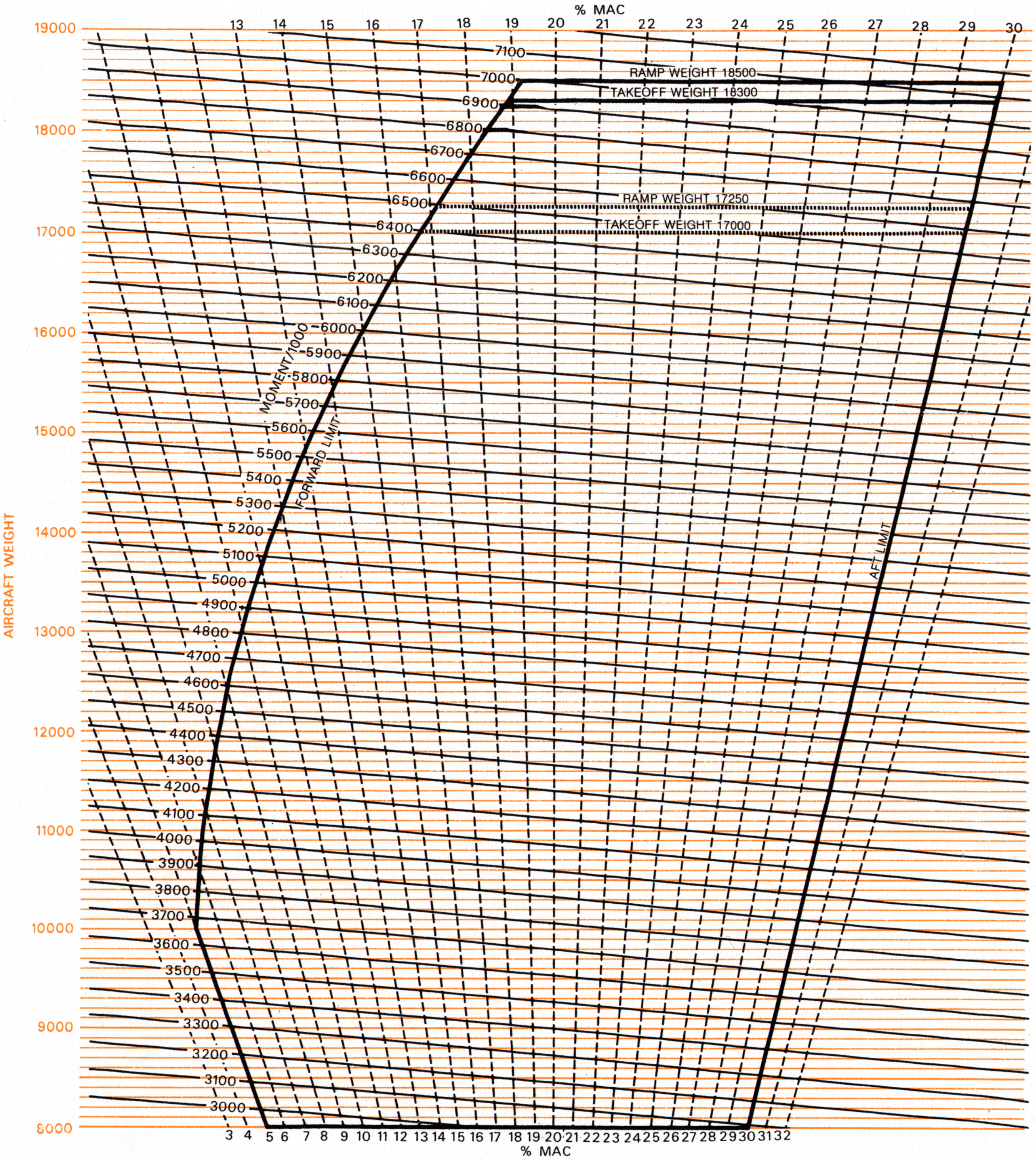


Figure 5

CENTER-OF-GRAVITY TABLE – MOMENT/1000

POUNDS GROSS WEIGHT	FWD LIMIT % MAC	FWD LIMIT STA.		10% MAC STA. 370.45	15% MAC STA. 374.58	20% MAC STA. 378.72	25% MAC STA. 382.86	AFT LIMIT 30% MAC STA. 387.00
8000	5.00	366.31	2930.48	2963.60	2996.64	3029.76	3062.88	3096.00
8100	5.00	366.31	2967.11	3000.65	3034.41	3067.63	3101.17	3134.70
8200	5.00	366.31	3003.74	3037.69	3071.56	3105.50	3139.45	3173.40
8300	5.00	366.31	3040.37	3074.74	3109.01	3143.38	3177.74	3212.10
8400	5.00	366.31	3077.00	3111.78	3146.47	3181.25	3216.02	3250.80
8500	5.00	366.31	3113.64	3148.83	3183.93	3219.12	3254.31	3289.50
8600	5.00	366.31	3150.27	3185.87	3221.39	3256.99	3292.60	3328.20
8700	5.00	366.31	3186.90	3222.92	3258.85	3294.86	3330.88	3366.90
8800	5.00	366.31	3223.53	3259.96	3296.30	3332.74	3369.17	3405.60
8900	5.00	366.31	3260.16	3297.01	3333.76	3370.61	3407.45	3444.30
9000	5.00	366.31	3296.79	3334.05	3371.22	3408.48	3445.74	3483.00
9100	5.00	366.31	3333.42	3371.10	3408.68	3446.35	3484.03	3521.70
9200	5.00	366.31	3370.05	3408.14	3446.14	3484.22	3522.31	3560.40
9300	5.00	366.31	3406.68	3445.19	3483.59	3522.10	3560.60	3599.10
9400	5.00	366.31	3443.31	3482.23	3521.05	3559.97	3598.88	3637.80
9500	5.00	366.31	3479.95	3519.28	3558.51	3597.84	3637.17	3676.50
9600	5.00	366.31	3516.58	3556.32	3595.97	3635.71	3675.46	3715.20
9700	5.00	366.31	3553.21	3593.37	3633.43	3673.58	3713.74	3753.90
9800	5.00	366.31	3589.84	3630.41	3670.88	3711.46	3752.03	3792.60
9900	5.00	366.31	3626.47	3667.45	3708.34	3749.33	3790.31	3831.30
10000	5.00	366.31	3663.10	3704.50	3745.80	3787.20	3828.60	3870.00
10100	5.16	366.44	3701.04	3741.55	3783.26	3825.07	3866.89	3908.70
10200	5.33	366.58	3739.12	3778.59	3820.72	3862.94	3905.17	3947.40
10300	5.50	366.72	3777.22	3815.64	3858.17	3900.82	3943.46	3986.10
10400	5.67	366.86	3815.34	3852.68	3895.63	3938.69	3981.74	4024.80
10500	5.84	367.00	3853.50	3889.73	3933.09	3976.56	4020.03	4063.50
10600	5.99	367.13	3891.58	3926.77	3970.55	4014.43	4058.32	4102.20
10700	6.16	367.27	3929.79	3963.82	4008.01	4052.30	4096.60	4140.90
10800	6.33	367.41	3968.03	4000.86	4045.46	4090.18	4134.89	4179.60
10900	6.50	367.55	4006.30	4037.91	4082.92	4128.05	4173.17	4218.30
11000	6.67	367.69	4044.59	4074.95	4120.38	4165.92	4211.46	4257.00
11100	6.83	367.82	4082.80	4112.00	4157.84	4203.79	4249.75	4295.70
11200	7.00	367.96	4121.15	4149.04	4195.30	4241.66	4288.03	4334.40
11300	7.17	368.10	4159.53	4186.09	4232.75	4279.54	4326.32	4373.10
11400	7.33	368.24	4197.94	4223.13	4270.21	4317.41	4364.60	4411.80
11500	7.50	368.38	4236.37	4260.18	4307.67	4355.28	4402.89	4450.50
11600	7.66	368.51	4274.72	4297.22	4345.13	4393.15	4441.18	4489.20
11700	7.83	368.65	4313.21	4334.27	4382.59	4431.02	4479.46	4527.90
11800	8.00	368.79	4351.72	4371.31	4420.04	4468.90	4517.75	4566.60
11900	8.17	368.93	4390.27	4408.36	4457.50	4506.77	4556.03	4605.30
12000	8.34	369.07	4428.84	4445.40	4494.96	4544.64	4594.32	4644.00
12100	8.50	369.20	4467.32	4482.45	4532.42	4582.51	4632.61	4682.70
12200	8.66	369.34	4505.95	4519.49	4569.88	4620.38	4670.89	4721.40
12300	8.83	369.48	4544.60	4556.54	4607.33	4658.26	4709.18	4760.10
12400	9.00	369.62	4583.29	4593.58	4644.79	4696.13	4747.46	4798.80
12500	9.17	369.76	4622.00	4630.63	4682.25	4734.00	4785.75	4837.50
12600	9.33	369.89	4660.61	4667.67	4719.71	4771.87	4824.04	4876.20
12700	9.50	370.03	4699.38	4704.72	4757.17	4809.74	4862.32	4914.90
12800	9.67	370.17	4738.18	4741.76	4794.62	4847.62	4900.61	4953.60
12900	9.84	370.31	4777.00	4778.81	4832.08	4885.49	4938.89	4992.30
				FWD LIMIT % MAC STA.				
13000				10.00 370.45 4815.85	4869.54	4923.36	4977.18	5031.00
13100				10.16 370.58 4854.60	4907.00	4961.23	5015.47	5069.70
13200				10.33 370.72 4893.50	4944.46	4999.10	5053.75	5108.40
13300				10.50 370.86 4932.44	4981.91	5036.98	5092.04	5147.10
13400				10.67 371.00 4971.40	5019.37	5074.85	5130.32	5185.80

POUNDS GROSS WEIGHT	FWD LIMIT % MAC	FWD LIMIT STA.		15% MAC STA. 374.58	20% MAC STA. 378.72	25% MAC STA. 382.86	AFT LIMIT 30% MAC STA. 387.00
13500	10.83	371.13	5010.26	5056.83	5112.72	5168.61	5224.50
13600	11.00	371.27	5049.27	5094.29	5150.59	5206.90	5263.20
13700	11.17	371.41	5088.32	5131.75	5188.46	5245.18	5301.90
13800	11.34	371.55	5127.39	5169.20	5226.34	5283.47	5340.60
13900	11.50	371.69	5166.49	5206.66	5264.21	5321.75	5379.30
14000	11.66	371.82	5205.48	5244.12	5302.08	5360.04	5418.00
14100	11.83	371.96	5244.64	5281.58	5339.95	5398.33	5456.70
14200	12.00	372.10	5283.82	5319.04	5377.82	5436.61	5495.40
14300	12.17	372.24	5323.03	5356.49	5415.70	5474.90	5534.10
14400	12.34	372.38	5362.27	5393.95	5453.57	5513.18	5572.80
14500	12.50	372.51	5401.40	5431.41	5491.44	5551.47	5611.50
14600	12.66	372.65	5440.69	5468.87	5529.31	5589.76	5650.20
14700	12.83	372.79	5480.01	5506.33	5567.18	5628.04	5688.90
14800	13.00	372.93	5519.36	5543.78	5605.06	5666.33	5727.60
14900	13.17	373.07	5558.74	5581.24	5642.93	5704.61	5766.30
15000	13.33	373.20	5598.00	5618.70	5680.80	5742.90	5805.00
15100	13.50	373.34	5637.43	5656.16	5718.67	5781.19	5843.70
15200	13.67	373.48	5676.90	5693.62	5756.54	5819.47	5882.40
15300	13.84	373.62	5716.39	5731.07	5794.42	5857.76	5921.10
15400	14.00	373.75	5755.75	5768.53	5832.29	5896.04	5959.80
15500	14.16	373.89	5795.30	5805.99	5870.16	5934.33	5998.50
15600	14.33	374.03	5834.87	5843.45	5908.03	5972.62	6037.20
15700	14.50	374.17	5874.47	5880.91	5945.90	6010.90	6075.90
15800	14.67	374.31	5914.10	5918.36	5983.78	6049.19	6114.60
15900	14.83	374.44	5953.60	5955.82	6021.65	6087.47	6153.30
				FWD LIMIT % MAC STA.			
16000				15.00 374.58 5993.28	6059.52	6125.76	6192.00
16100				15.17 374.72 6032.99	6097.39	6164.05	6230.70
16200				15.34 374.86 6072.73	6135.26	6202.33	6269.40
16300				15.50 375.00 6112.50	6173.14	6240.62	6308.10
16400				15.66 375.13 6152.13	6211.01	6278.90	6346.80
16500				15.83 375.27 6191.96	6248.88	6317.19	6385.50
16600				16.00 375.41 6231.81	6286.75	6355.48	6424.20
16700				16.17 375.55 6271.69	6324.62	6393.76	6462.90
16800				16.34 375.69 6311.59	6362.50	6432.05	6501.60
16900				16.50 375.82 6351.36	6400.37	6470.33	6540.30
17000				16.66 375.96 6391.32	6438.24	6508.62	6579.00
17100				16.83 376.10 6431.31	6476.11	6546.91	6617.70
17200				17.00 376.24 6471.33	6513.98	6585.19	6656.40
17250				17.09 376.31 6491.35	6532.92	6604.34	6675.75
17300				17.17 376.38 6511.37	6551.86	6623.48	6695.10
17400				17.33 376.51 6551.27	6589.73	6661.76	6733.80
17500				17.50 376.65 6591.38	6627.60	6700.05	6772.50
17600				17.67 376.79 6631.50	6665.47	6738.34	6811.20
17700				17.89 376.97 6672.37	6703.34	6776.62	6849.90
17800				17.99 377.06 6711.67	6741.22	6814.91	6888.60
17900				18.18 377.21 6752.06	6779.09	6853.19	6927.30
18000				18.33 377.34 6792.12	6816.96	6891.48	6966.00
18100				18.50 377.48 6832.39	6854.83	6929.77	7004.70
18200				18.67 377.62 6872.68	6892.70	6958.05	7043.40
18250				18.76 377.69 6892.84	6911.64	6987.20	7062.75
18300				18.83 377.75 6912.83	6930.58	7006.34	7082.10
18350				18.91 377.82 6933.00	6949.51	7025.48	7101.45
18400				19.00 377.89 6953.18	6968.45	7044.62	7120.80
18450				19.08 377.96 6973.36	6987.38	7063.77	7140.15
18500				19.17 378.03 6993.56	7006.32	7082.91	7159.50

▨ Forward C.G. Limit

Figure 6

USABLE FUEL MOMENT – MODEL 35A WING AND FUSELAGE TANKS

GALLONS	POUNDS		MOMENT/1000			
	Kerosene 6.7#/gallon	JP-4 6.5#/gallon	WINGS		FUSELAGE	
			Kerosene	JP-4	Kerosene	JP-4
20	134	130	51.60	50.06	58 52	56 77
40	268	260	103.17	100.09	117 88	114 36
60	402	390	154.62	150.00	177.22	171 93
80	536	520	205.97	199.82	236 22	229 17
100	670	650	257 48	249.79	294.99	286.18
120	804	780	309.04	299.81	353 88	343.32
140	938	910	360 70	349.93	412.96	400 63
160	1072	1040	412.45	400 14	472.16	458.07
180	1206	1170	464 25	450.39	531.12	515.27
200	1340	1300	516.10	500.69	589 85	572 24
220	1474	1430	568.02	551.06		
240	1608	1560	620.12	601.61		
260	1742	1690	672 27	652.20		
280	1876	1820	724.60	702.97		
300	2010	1950	777 06	753.87		
320	2144	2080	829 62	804.85		
340	2278	2210	882 22	855.88		
360	2412	2340	935.01	907.10		
374	2508	2431	972.83	942.95		

Figure 7 (Sheet 1 of 4)

USABLE FUEL MOMENT – MODEL 36A WING AND FUSELAGE TANKS

GALLONS	POUNDS		MOMENT/1000			
	Kerosene 6.7#/gallon	JP-4 6.5#/gallon	WINGS		FUSELAGE	
			Kerosene	JP-4	Kerosene	JP-4
20	134	130	51 60	50 06	58 74	56 99
40	268	260	103 17	100.09	117 65	114 14
60	402	390	154 62	150 00	176.46	171 19
80	536	520	205 97	199 82	234 69	227 68
100	670	650	257 48	249 79	291 12	282 43
120	804	780	309 04	299.81	346 69	336 34
140	938	910	360 70	349 93	402 68	390 66
160	1072	1040	412 45	400 14	458 87	445.17
180	1206	1170	464.25	450 39	515 18	499 80
200	1340	1300	516 10	500 69	571.64	554 58
220	1474	1430	568 02	551.06	628 12	609 37
240	1608	1560	620 12	601 61	684 53	664 10
260	1742	1690	672 27	652 20	740 87	718 75
280	1876	1820	724 60	702 97	797 17	773 37
300	2010	1950	777 06	753 87	853.39	827 92
320	2144	2080	829 62	804 85	909.59	882.44
340	2278	2210	882.22	855 88	965 48	936 66
360	2412	2340	935 01	907.10	1020 76	990 29
374	2508	2431	972.83	942 95		
379	2542	2466			1074 02	1041 96

Figure 7 (Sheet 2 of 4)

USABLE FUEL MOMENT – MODELS 35A/36A – TIP TANKS

STANDARD TIP TANK WITH RECOGNITION LIGHT IN RH TIP TANK AND FUEL DUMP

GALLONS	KEROSENE 6.7#/GALLON	JP-4 6.5#/GALLON	MOMENT/1000	
			KEROSENE	JP-4
20	134	130	53 20	51 61
40	268	260	106 40	103 22
60	402	390	159 39	154 64
80	536	520	212 09	205 76
100	670	650	264 55	256 65
120	804	780	316 86	307 40
140	938	910	369.01	357 99
160	1072	1040	421 08	408 51
180	1206	1170	473 08	458 96
200	1340	1300	525 01	509 34
220	1474	1430	576 85	559 63
240	1608	1560	628 52	609 73
260	1742	1690	680 16	659 86
280	1876	1820	731.73	709 89
300	2010	1950	783 24	759 86
320	2144	2080	834 55	809 64
340	2278	2210	885 91	859 47
357	2390	2320	928 75	901 55

TIP TANKS WITH RECOGNITION LIGHT IN BOTH TIP TANKS AND FUEL DUMP

GALLONS	KEROSENE 6.7#/GALLON	JP-4 6.5#/GALLON	MOMENT/1000	
			KEROSENE	JP-4
20	134	130	53 20	51 61
40	268	260	106 40	103 22
60	402	390	159 39	154 63
80	536	520	212 20	205.87
100	670	650	264 75	256 85
120	804	780	317.14	307 67
140	938	910	369 38	358.36
160	1072	1040	421 42	408 84
180	1206	1170	473 62	459 48
200	1340	1300	525.78	510 08
220	1474	1430	577.84	560 59
240	1608	1560	629 89	611 08
260	1742	1690	681 82	661 47
280	1876	1820	733 63	711 73
300	2010	1950	785 21	761 78
320	2144	2080	836 70	811.72
340	2278	2210	888 08	861 57
351	2350	2280	915 80	888 52

Figure 7 (Sheet 3 of 4)

USABLE FUEL MOMENT – MODEL 35A – WINGS, TIP TANKS & FUSELAGE

	USABLE	
FUEL	POUNDS	MOM/1000
KEROSENE (6.7#/GAL)	6238	2491.43
JP-4 (6.5#/GAL)	6051	2416.74

USABLE FUEL MOMENT – MODEL 36A – WINGS, TIP TANKS & FUSELAGE

	USABLE	
FUEL	POUNDS	MOM/1000
KEROSENE (6.7#/GAL)	7440	2975.6
JP-4 (6.5#/GAL)	7217	2886.46

USABLE FUEL MOMENT – MODEL 35A/36A – WINGS & TIP TANKS

	USABLE	
FUEL	POUNDS	MOM/1000
KEROSENE (6.7#/GAL)	4898	1901.58
JP-4 (6.5#/GAL)	4751	1844.50

Figure 7 (Sheet 4 of 4)

FUEL TANK CAPACITIES - USABLE

LOCATION	MODEL 35A GALLONS	MODEL 36A GALLONS
Wings	374	374
Tip Tanks	357	357
Fuselage Tank	200	379
TOTAL	931	1110

Figure 8

FUEL USED vs. MOMENT LOSS
(FOR FLIGHT PLANNING)

FUSELAGE TANK (35A)		FUSELAGE TANK (36A)	
FUEL USED POUNDS 6.7#/GALLON	FUSELAGE (35A) MOMENT/1000	FUEL USED POUNDS 6.7#/GALLON	FUSELAGE (36A) MOMENT/1000
134	58.73	130	53.26
268	117.69	264	108.54
402	176.90	398	164.43
536	235.98	532	220.63
670	294.87	666	276.85
804	353.64	800	333.15
938	412.64	934	389.49
1072	471.98	1068	445.90
1206	531.34	1202	502.38
1340	589.85	1336	558.84
		1470	615.15
		1604	671.34
		1738	727.33
		1872	782.90
		2006	839.33
		2140	897.55
		2274	956.36
		2408	1015.28
		2542	1074.02

Figure 9 (Sheet 1 of 2)

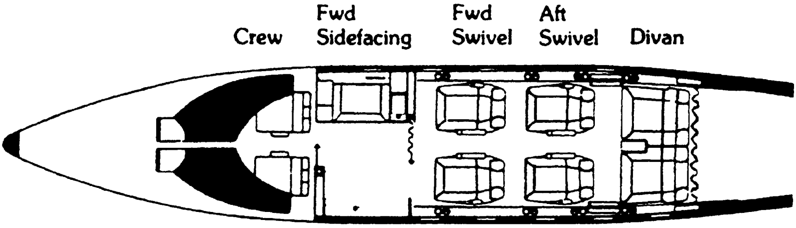
FUEL USED vs. MOMENT LOSS (FOR FLIGHT PLANNING)

TIP TANKS WITH RH RECOGNITION LIGHT MODEL 35A/36A		WING TANKS (35A/36A)	
FUEL USED POUNDS 6.7#/GALLON	**TIP TANK MOMENT/1000**	**FUEL USED POUNDS 6.7#/GALLON**	**WING MOMENT/1000**
112	42.84	96	37.82
246	94.20	230	90.60
380	145.51	364	143.21
514	197.02	498	195.76
648	248.59	632	248.22
782	300 23	766	300.55
916	351.90	900	352.70
1050	403.74	1034	404.80
1184	455 67	1168	456.72
1318	507.67	1302	508.56
1452	559.74	1436	560.36
1586	611.89	1570	612.11
1720	664.20	1704	663.77
1854	716.66	1838	715 34
1988	769.36	1972	766.84
2122	822.35	2106	818.18
2256	875.55	2240	869.63
2390	928.75	2374	921.22
		2508	972.83

Figure 9 (Sheet 2 of 2)

SEATING ARRANGEMENTS – MODEL 35A

CARGO DOOR


Crew
Fwd Sidefacing
Fwd Swivel
Aft Swivel
Divan

EXECUTIVE DOOR

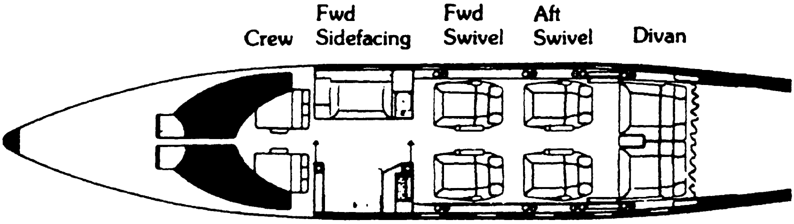
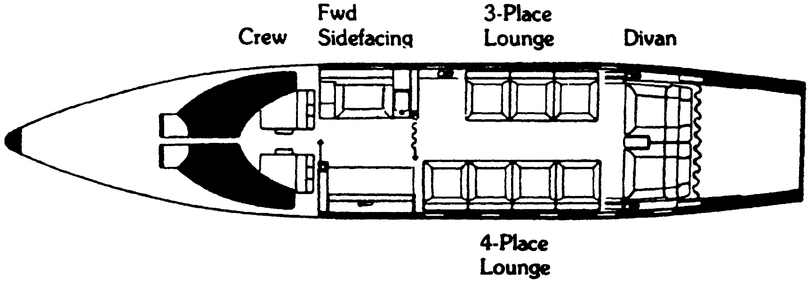

Crew
Fwd Sidefacing
Fwd Swivel
Aft Swivel
Divan

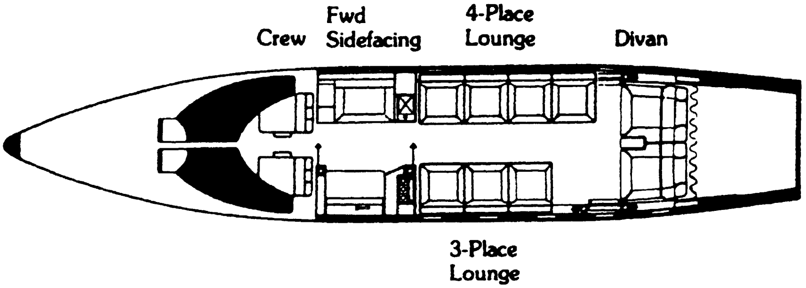
Figure 10 (Sheet 1 of 7)

SEATING ARRANGEMENTS – MODEL 35A (CONT)

CARGO DOOR


Crew
Fwd Sidefacing
3-Place Lounge
Divan
4-Place Lounge

EXECUTIVE DOOR


Crew
Fwd Sidefacing
4-Place Lounge
Divan
3-Place Lounge

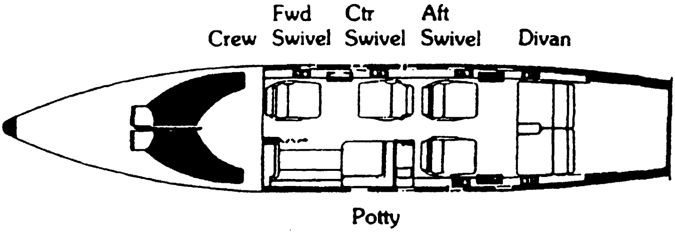
NOTE The approved maximum number of people aboard is thirteen. Of these two are crew members and one is an attendant.

Figure 10 (Sheet 2 of 7)

SEATING ARRANGEMENTS – MODEL 35A (CONT)

SEATING
MID-CABINET ARRANGEMENT

CARGO DOOR


Crew
Fwd Swivel
Ctr Swivel
Aft Swivel
Divan
Potty

EXECUTIVE DOOR

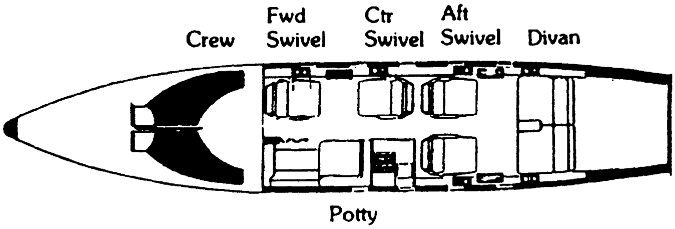
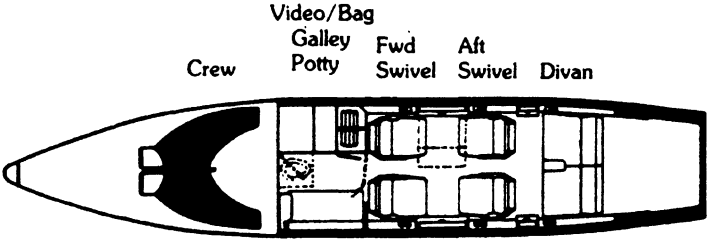

Crew
Fwd Swivel
Ctr Swivel
Aft Swivel
Divan
Potty

Figure 10 (Sheet 3 of 7)

SEATING ARRANGEMENTS – MODEL 35A (CONT)

SEATING
CLUB INTERIOR ARRANGEMENT

CARGO DOOR


Video/Bag
Galley
Potty
Crew
Fwd
Swivel
Aft
Swivel
Divan

EXECUTIVE DOOR

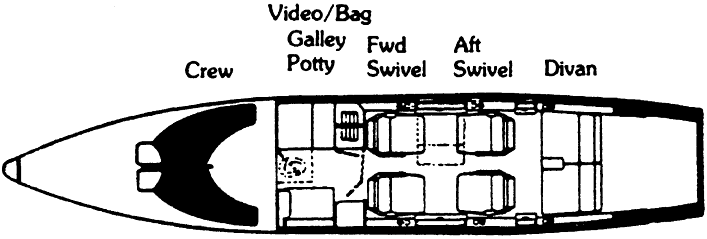
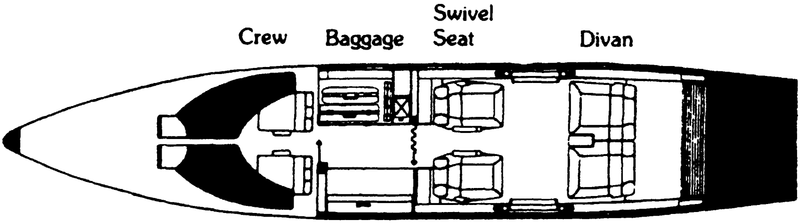

Video/Bag
Galley
Potty
Crew
Fwd
Swivel
Aft
Swivel
Divan

Figure 10 (Sheet 4 of 7)

SEATING ARRANGEMENTS – MODEL 36A

CARGO DOOR


Crew
Baggage
Swivel Seat
Divan

EXECUTIVE DOOR

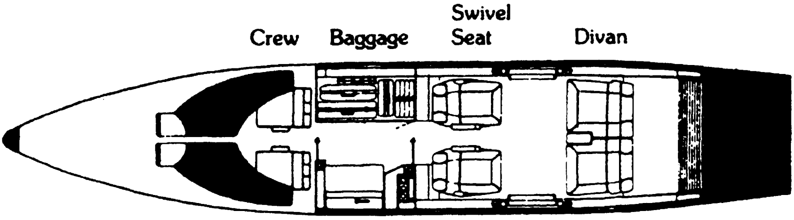
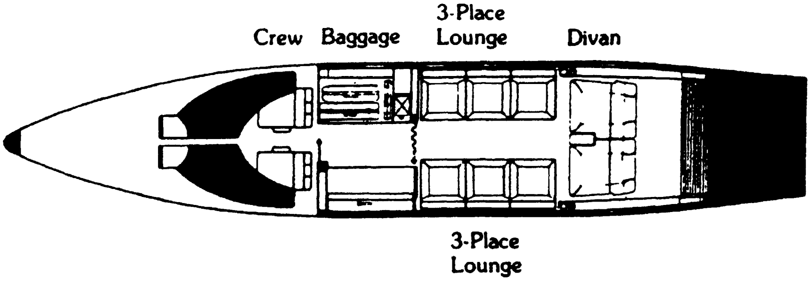

Crew
Baggage
Swivel Seat
Divan

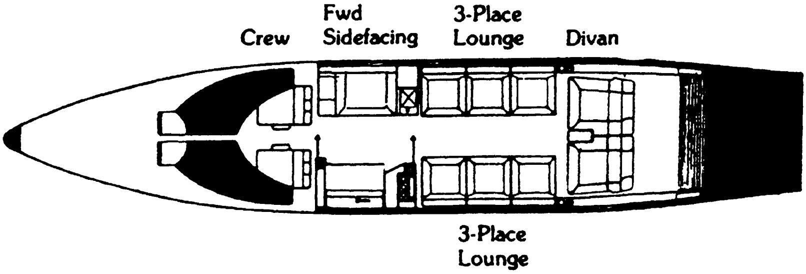
Figure 10 (Sheet 5 of 7)

SEATING ARRANGEMENTS – MODEL 36A (CONT)

CARGO DOOR


Crew
Baggage
3-Place Lounge
Divan
3-Place Lounge

EXECUTIVE DOOR


Crew
Fwd Sidefacing
3-Place Lounge
Divan
3-Place Lounge

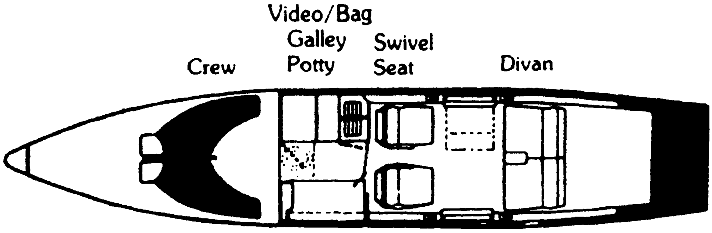
NOTE The approved maximum number of people aboard is thirteen. Of these two are crew members and one is an attendant.

Figure 10 (Sheet 6 of 7)

SEATING ARRANGEMENTS – MODEL 36A (CONT)

SEATING
CLUB INTERIOR ARRANGEMENT

CARGO DOOR


Video/Bag
Galley
Potty
Swivel
Seat
Crew
Divan

EXECUTIVE DOOR

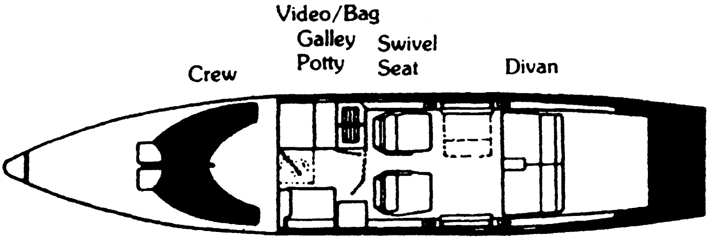

Video/Bag
Galley
Potty
Swivel
Seat
Crew
Divan

Figure 10 (Sheet 7 of 7)

PASSENGER AND CREW TABLE – MODEL 35A STANDARD SEATING – MOMENT/1000

WEIGHT	CREW STA. 204	FWD. SIDEFACING STA. 237.8	FWD. SWIVEL STA. 294	AFT SWIVEL STA. 313.2	DIVAN STA. 362.4
10	2.04	2.38	2.94	3.13	3.62
20	4.08	4.76	5.88	6.26	7.25
30	6.12	7.13	8.82	9.40	10.87
40	8.16	9.51	11.76	12.53	14.50
50	10.20	11.89	14.70	15.66	18.12
60	12.24	14.27	17.64	18.79	21.74
70	14.28	16.65	20.58	21.92	25.37
80	16.32	19.02	23.52	25.06	28.99
90	18.36	21.40	26.46	28.19	32.62
100	20.40	23.78	29.40	31.32	36.24
110	22.44	26.16	32.34	34.45	39.86
120	24.48	28.54	35.28	37.58	43.49
130	26.52	30.91	38.22	40.72	47.11
140	28.56	33.29	41.16	43.85	50.74
150	30.60	35.67	44.10	46.98	54.36
160	32.64	38.05	47.04	50.11	57.98
170	34.68	40.43	49.98	53.24	61.61
180	36.72	42.80	52.92	56.38	65.23
190	38.76	45.18	55.86	59.51	68.86
200	40.80	47.56	58.80	62.64	72.48
210	42.84	49.94	61.74	65.77	76.10
220	44.88	52.32	64.68	68.90	79.73
230	46.92	54.69	67.62	72.04	83.35
240	48.96	57.07	70.56	75.17	86.98
250	51.00	59.45	73.50	78.30	90.60
260	53.04		76.44	81.43	94.22
270	55.08		79.38	84.56	97.84
280	57.12		82.32	87.70	101.47
290	59.16		85.26	90.83	105.10
300	61.20		88.20	93.96	108.72
310	63.24		91.14	97.09	112.34
320	65.28		94.08	100.22	115.97
330	67.32		97.02	103.36	119.59
340	69.36		99.96	106.49	123.22
350	71.40		102.90	109.62	126.84
360	73.44		105.84	112.75	130.46
370	75.48		108.78	115.88	134.09
380	77.52		111.72	119.02	137.71
390	79.56		114.66	122.15	141.34
400	81.60		117.60	125.28	144.96
410	83.64		120.54	128.41	148.58
420	85.68		123.48	131.54	152.21
430	87.72		126.42	134.68	155.83
440	89.76		129.36	137.81	159.46
450	91.80		132.30	140.94	163.08
460	93.84		135.24	144.07	166.70
470	95.88		138.18	147.20	170.33
480	97.92		141.12	150.34	173.95
490	99.96		144.06	153.47	177.58
500	102.00		147.00	156.60	181.20
510					184.82
520					188.45
530					192.07
540					195.70
550					199.32
560					202.94
570					206.57
580					210.19
590					213.82
600					217.44

Figure 11 (Sheet 1 of 12)

PASSENGER TABLE – MODEL 35A
ALTERNATE SEATING ARRANGEMENT – MOMENT/1000

	A/C with Executive Door RH or LH Lounge A/C with Cargo Door RH Lounge				A/C with Cargo Door LH Lounge			
Weight	Sta. 270	Sta. 290	Sta. 310	Sta. 330	Sta. 280	Sta. 300	Sta. 320	Sta. 340
10	2.7	2.9	3.1	3.3	2.8	3.0	3.2	3.4
20	5.4	5.8	6.2	6.6	5.6	6.0	6.4	6.8
30	8.1	8.7	9.3	9.9	8.4	9.0	9.6	10.2
40	10.8	11.6	12.4	13.2	11.2	12.0	12.8	13.6
50	13.5	14.5	15.5	16.5	14.0	15.0	16.0	17.0
60	16.2	17.4	18.6	19.8	16.8	18.0	19.2	20.4
70	18.9	20.3	21.7	23.1	19.6	21.0	22.4	23.8
80	21.6	23.2	24.8	26.4	22.4	24.0	25.6	27.2
90	24.3	26.1	27.9	29.7	25.2	27.0	28.8	30.6
100	27.0	29.0	31.0	33.0	28.0	30.0	32.0	34.0
110	29.7	31.9	34.1	36.3	30.8	33.0	35.2	37.4
120	32.4	34.8	37.2	39.6	33.6	36.0	38.4	40.8
130	35.1	37.7	40.3	42.9	36.4	39.0	41.6	44.2
140	37.8	40.6	43.4	46.2	39.2	42.0	44.8	47.6
150	40.5	43.5	46.5	49.5	42.0	45.0	48.0	51.0
160	43.2	46.4	49.6	52.8	44.8	48.0	51.2	54.4
170	45.9	49.3	52.7	56.1	47.6	51.0	54.4	57.8
180	48.6	52.2	55.8	59.4	50.4	54.0	57.6	61.2
190	51.3	55.1	58.9	62.7	53.2	57.0	60.8	64.6
200	54.0	58.0	62.0	66.0	56.0	60.0	64.0	68.0
210	56.7	60.9	65.1	69.3	58.8	63.0	67.2	71.4
220	59.4	63.8	68.2	72.6	61.6	66.0	70.4	74.8
230	62.1	66.7	71.3	75.9	64.4	69.0	73.6	78.2
240	64.8	69.6	74.4	79.2	67.2	72.0	76.8	81.6
250	67.5	72.5	77.5	82.5	70.0	75.0	80.0	85.0

NOTE The approved maximum number of people aboard is thirteen. Of these two are crew members and one is an attendant.

Figure 11 (Sheet 2 of 12)

PASSENGER TABLE – MODEL 35A
ALTERNATE SEATING ARRANGEMENT – MOMENT/1000

MID-CABINET CONFIGURATION

(MOMENT/1000)		
WEIGHT	A/C with Exec. Door and Potty on LH Side Aft of Door Potty Pass. Sta. 256.2	A/C with Cargo Door and Potty on LH Side Aft of Door Potty Pass. Sta. 268.2
10	2.56	2.68
20	5.12	5.36
30	7.69	8.05
40	10.25	10.73
50	12.81	13.41
60	15.37	16.09
70	17.93	18.77
80	20.50	21.46
90	23.06	24.14
100	25.62	26.82
110	28.18	29.50
120	30.74	32.18
130	33.31	34.87
140	35.87	37.55
150	38.43	40.23
160	40.99	42.91
170	43.55	45.59
180	46.12	48.28
190	48.68	50.96
200	51.24	53.64
210	53.80	56.32
220	56.36	59.00
230	58.93	61.69
240	61.49	64.37
250	64.05	67.05

Figure 11 (Sheet 3 of 12)

PASSENGER TABLE – MODEL 35A
ALTERNATE SEATING ARRANGEMENT – MOMENT/100

MID-CABINET POTTY AFT OF DOOR CONFIGURATION

(MOMENT/1000)		
WEIGHT	RH FWD SWIVEL STA. 236	RH CENTER SWIVEL STA. 270
10	2.36	2.70
20	4.72	5.40
30	7.08	8.10
40	9.44	10.80
50	11.80	13.50
60	14.16	16.20
70	16.52	18.90
80	18.88	21.60
90	21.24	24.30
100	23.60	27.00
110	25.96	29.70
120	28.32	32.40
130	30.68	35.10
140	33.04	37.80
150	35.40	40.50
160	37.76	43.20
170	40.12	45.90
180	42.48	48.60
190	44.84	51.30
200	47.20	54.00
210	49.56	56.70
220	51.92	59.40
230	54.28	62.10
240	56.64	64.80
250	59.00	67.50

Figure 11 (Sheet 4 of 12)

PASSENGER TABLE – MODEL 35A ALTERNATE SEATING ARRANGEMENT – MOMENT/1000

CLUB INTERIOR CONFIGURATION

WEIGHT	FWD. SWIVEL STA. 283	AFT. SWIVEL STA. 317	DIVAN STA. 360
10	2.83	3.17	3.60
20	5.66	6.34	7.20
30	8.49	9.51	10.80
40	11.32	12.68	14.40
50	14.15	15.85	18.00
60	16.98	19.02	21.60
70	19.81	22.19	25.20
80	22.64	25.36	28.80
90	25.47	28.53	32.40
100	28.30	31.70	36.00
110	31.13	34.87	39.60
120	33.96	38.04	43.20
130	36.79	41.21	46.80
140	39.62	44.38	50.40
150	42.45	47.55	54.00
160	45.28	50.72	57.60
170	48.11	53.89	61.20
180	50.94	57.06	64.80
190	53.77	60.23	68.40
200	56.60	63.40	72.00
210	59.43	66.57	75.60
220	62.26	69.74	79.20
230	65.09	72.91	82.80
240	67.92	76.08	86.40
250	70.75	79.25	90.00
260	73.58	82.42	93.60
270	76.41	85.59	97.20
280	79.24	88.76	100.80
290	82.07	91.93	104.40
300	84.90	95.10	108.00
310	87.73	98.27	111.60
320	90.56	101.44	115.20
330	93.39	104.61	118.80
340	96.22	107.78	122.40
350	99.05	110.95	126.00
360	101.88	114.12	129.60
370	104.71	117.29	133.20
380	107.54	144.40	136.80
390	110.37	123.63	140.40
400	113.20	126.80	144.40
410	116.03	129.97	147.60
420	118.86	133.14	151.20
430	121.69	136.31	154.80
440	124.52	139.48	158.40
450	127.35	142.65	162.00
460	130.18	145.82	165.60
470	133.01	148.99	169.20
480	135.84	152.16	172.80
490	138.67	155.33	176.40
500	141.50	158.50	180.00
510			183.60
520			187.20
530			190.80
540			194.40
550			198.00
560			201.60
570			205.20
580			208.80
590			212.40
600			216.00

Figure 11 (Sheet 5 of 12)

PASSENGER TABLE – MODEL 35A OR 36A
WITH JUMP SEAT – MOMENT/1000

Weight	Sta. (227) Mom/1000
10	2.27
20	4.54
30	6.81
40	9.08
50	11.35
60	13.62
70	15.89
80	18.16
90	20.43
100	22.70
110	24.97
120	27.24
130	29.51
140	31.78
150	34.05
160	36.32
170	38.59
180	40.86
190	43.13
200	45.40

Figure 11 (Sheet 6 of 12)

PASSENGER AND CREW TABLE – MODEL 36A STANDARD SEATING – MOMENT/1000

WEIGHT	CREW STA. 204	L.H. SWIVEL STA. 287.4	R.H. SWIVEL STA. 287.7	DIVAN STA. 334.1
10	2.04	2.87	2.88	3.34
20	4.08	5.75	5.75	6.68
30	6.12	8.62	8.63	10.02
40	8.16	11.50	11.51	13.36
50	10.20	14.37	14.39	16.71
60	12.24	17.24	17.26	20.05
70	14.28	20.12	20.14	23.39
80	16.32	22.99	23.02	26.73
90	18.36	25.87	25.89	30.07
100	20.40	28.74	28.77	33.41
110	22.44	31.61	31.65	36.75
120	24.48	34.49	34.52	40.09
130	26.52	37.36	37.40	43.43
140	28.56	40.24	40.28	46.77
150	30.60	43.11	43.16	50.12
160	32.64	45.98	46.03	53.46
170	34.68	48.86	48.91	56.80
180	36.72	51.73	51.79	60.14
190	38.76	54.61	54.66	63.48
200	40.80	57.48	57.54	66.82
210	42.84	60.35	60.42	70.16
220	44.88	63.23	63.29	73.50
230	46.92	66.10	66.19	76.84
240	48.96	68.98	69.05	80.18
250	51.00	71.85	71.93	83.53
260	53.04			86 87
270	55.08			90 21
280	57.12			93 54
290	59.16			96 89
300	61.20			100.23
310	63.24			103.57
320	65.28			106.91
330	67.32			110.25
340	69.36			113.59
350	71.40			116.94
360	73.44			120.28
370	75.48			123.62
380	77.52			126.96
390	79.56			130.30
400	81.60			133.64
410	83.64			136.98
420	85.68			140.32
430	87.72			143.66
440	89.76			147.00
450	91.80			150.35
460	93.84			153.69
470	95.88			157.03
480	97.92			160.37
490	99.96			163.71
500	102.00			167.05
510				170.39
520				173.73
530				177.07
540				180.41
550				183.76
560				187.10
570				190.44
580				193.78
590				197.12
600				200.46

Figure 11 (Sheet 7 of 12)

PASSENGER TABLE – MODEL 36A ALTERNATE SEATING ARRANGEMENT – MOMENT/1000

	A/C with Executive Door RH or LH Lounge A/C with Cargo Door RH Lounge			A/C with Cargo Door LH Lounge			RH Fwd. Sidefacing No Fwd. Baggage
Weight	Sta. 270	Sta. 290	Sta. 310	Sta. 280	Sta. 300	Sta. 320	Sta. 235
10	2.7	2.9	3.1	2.8	3.0	3.2	2.35
20	5.4	5.8	6.2	5.6	6.0	6.4	4.70
30	8.1	8.7	9.3	8.4	9.0	9.6	7.05
40	10.8	11.6	12.4	11.2	12.0	12.8	9.40
50	13.5	14.5	15.5	14.0	15.0	16.0	11.75
60	16.2	17.4	18.6	16.8	18.0	19.2	14.10
70	18.9	20.3	21.7	19.6	21.0	22.4	16.45
80	21.6	23.2	24.8	22.4	24.0	25.6	18.80
90	24.3	26.1	27.9	25.2	27.0	28.8	21.15
100	27.0	29.0	31.0	28.0	30.0	32.0	23.50
110	29.7	31.6	34.1	30.8	33.0	35.2	25.85
120	32.4	34.8	37.2	33.6	36.0	38.4	28.20
130	35.1	37.7	40.3	36.4	39.0	41.6	30.55
140	37.8	40.6	43.4	39.2	42.0	44.8	32.90
150	40.5	43.5	46.5	42.0	45.0	48.0	35.25
160	43.2	46.4	49.6	44.8	48.0	51.2	37.60
170	45.9	49.3	52.7	47.6	51.0	54.4	39.95
180	48.6	52.2	55.8	50.4	54.0	57.6	42.30
190	51.3	55.1	58.9	53.2	57.0	60.8	44.65
200	54.0	58.0	62.0	56.0	60.0	64.0	47.00
210	56.7	60.9	65.1	58.8	63.0	67.2	49.35
220	59.4	63.8	68.2	61.6	66.0	70.4	51.70
230	62.1	66.7	71.3	64.4	69.0	73.6	54.05
240	64.8	69.6	74.4	67.2	72.0	76.8	65.40
250	67.5	72.5	77.5	70.0	75.0	80.0	58.75

NOTE

The approved maximum number of people aboard is thirteen. Of these two are crew members and one is an attendant.

Figure 11 (Sheet 8 of 12)

PASSENGER TABLE – MODEL 36A
ALTERNATE SEATING ARRANGEMENT – MOMENT/1000

CLUB INTERIOR CONFIGURATION

WEIGHT	FWD. SWIVEL STA. 283	DIVAN STA. 334.1
10	2.83	3.34
20	5.66	6.68
30	8.49	10.02
40	11.32	13.36
50	14.15	16.71
60	16.98	20.05
70	19.81	23.39
80	22.64	26.73
90	25.47	30.07
100	28.30	33.41
110	31.13	36.75
120	33.96	40.09
130	36.79	43.43
140	39.62	46.77
150	42.45	50.12
160	45.28	53.46
170	48.11	56.80
180	50.94	60.14
190	53.77	63.48
200	56.60	66.82
210	59.43	70.16
220	62.26	73.50
230	65.09	76.84
240	67.92	80.18
250	70.75	83.53
260	73.58	86.87
270	76.41	90.21
280	79.24	93.54
290	82.07	96.89
300	84.90	100.23
310	87.73	103.57
320	90.56	106.91
330	93.39	110.25
340	96.22	113.59
350	99.05	116.94
360	101.88	120.28
370	104.71	123.62
380	107.54	126.96
390	110.37	130.30
400	113.20	133.64
410	116.03	136.98
420	118.86	140.32
430	121.69	143.66
440	124.52	147.00
450	127.35	150.35
460	130.18	153.69
470	133.01	157.03
480	135.84	160.37
490	138.67	163.71
500	141.50	167.05
510		170.39
520		173.73
530		177.07
540		180.41
550		183.76
560		187.10
570		190.44
580		193.78
590		197.12
600		200.46

Figure 11 (Sheet 9 of 12)

BAGGAGE COMPARTMENT – MOMENT/1000

Weight	35A or 36A FWD.* Moment/ 1000 Sta. 227	Weight	35A or 36A FWD. Moment/ 1000 Sta. 233	Weight	35A or 36A FWD. Moment/ 1000 Sta. 254	Weight	35A Aft Moment/ 1000 Sta. 402	Weight	36A Aft Moment/ 1000 Sta. 360
10	2.27	10	2.33	10	2.54	10	4.02	10	3.60
20	4.54	20	4.66	20	5.08	20	8.04	20	7.20
30	6.81	30	6.99	30	7.62	30	12.06	30	10.80
40	9.08	40	9.32	40	10.16	40	16.08	40	14.40
50	11.35	50	11.65	50	12.70	50	20.10	50	18.00
60	13.62	60	13.98	60	15.24	60	24.12	60	21.60
70	15.89	70	16.31	70	17.78	70	28.14	70	25.20
80	18.16	80	18.64	80	20.32	80	32.16	80	28.80
90	20.43	90	20.97	90	22.86	90	36.18	90	32.40
100	22.70	100	23.70	100	25.40	100	40.20	100	36.00
		110	25.63			110	44.22	110	39.60
		120	27.96			120	48.24	120	43.20
		130	30.29			130	52.26	130	46.80
		140	32.62			140	56.28	140	50.40
		150	34.95			150	60.30	150	54.00
		160	37.28			160	64.32	160	57.60
		170	39.61			170	68.34	170	61.20
		180	41.94			180	72.36	180	64.80
		190	44.27			190	76.38	190	68.40
		200	46.60			200	80.40	200	72.00
		210	48.93			210	84.42	210	75.60
		220	51.26			220	88.44	220	79.20
		230	52.59			230	92.46	230	82.80
		240	55.92			240	96.48	240	86.40
		250	58.25			250	100.50	250	90.00
		260	60.58			260	104.52	260	93.20
		270	62.91			270	108.54	270	97.20
		280	65.24			280	112.56	280	100.80
		290	67.57			290	116.58	290	104.40
		300	69.90			300	120.60	300	108.00
						310	124.62	310	111.60
						320	128.64	320	115.20
						330	132.66	330	118.80
						340	136.68	340	122.40
						350	140.70	350	126.00
						360	144.72	360	129.60
						370	148.74	370	133.20
						380	152.76	380	136.80
						390	156.78	390	140.40
						400	160.80	400	144.00
						410	164.82	410	147.60
						420	168.84	420	151.20
						430	172.86	430	154.80
						440	176.88	440	158.40
						450	180.90	450	162.00
						460	184.92	460	165.60
						470	188.94	470	169.20
						480	192.96	480	172.80
						490	196.98	490	176.40
						500	201.00	500	180.00

*A/C without Entertainment Center.

Figure 11 (Sheet 10 of 12)

PROVISIONS – MOMENT/1000

TOILET CHEMICALS

Sta. 235	Mom/1000
4.2 lbs.	1.00

WATER

Sta. 253	Mom/1000
15 lbs.	3.80
Sta. 278	
7.1 lbs	1.97
Sta. 264.8	
7.1 lbs	1.88

PROVISIONS
Fwd. Cabinets (Sta. 219)

Wt.	Mom/1000
5	1.10
10	2.19
15	3.29
20	4.38
25	5.48

PROVISIONS RH OR LH
AFT CABINET (Sta. 253)

Wt.	Mom/1000
5	1.27
10	2.53
15	3.80
20	5.06
25	6.33
30	7.59
32	8.10

MID-CABINET PROVISIONS

		AIRCRAFT WITH	
		EXEC. DOOR	CARGO DOOR
Wt.		Mom/1000	Mom/1000
14	Decanters (Full)	3.71(Sta. 265.)	3.90 (Sta. 278.5)
18	Mapco Thermos (Full)	4.18(Sta. 232.2)	5.12 (Sta. 284.4)
16	Small Drawers	4.58(Sta. 286.2)	4.44 (Sta. 277.5)
23	Large Drawer	6.38(Sta. 277.3)	6.45 (Sta. 280.4)

or

Wt.		Mom/1000	Mom/1000
14	Decanters (Full)	3.71(Sta. 265.)	3.90(Sta. 278.5)
15	Mapco Oven	3.98(Sta. 265.3)	4.18(Sta. 278.6)
16	Small Drawers	4.36(Sta. 272.5)	4.58(Sta. 286.2)
23	Large Drawer	6.08(Sta. 264.3)	6.38(Sta. 277.3)

MID-CABINET TOILET CHEMICALS

EXEC. DOOR		CARGO DOOR	
Sta. 255.2	Mom/1000	Sta. 267.2	Mom/1000
4.2 lbs.	1.07	4.2 lbs	1.12

Figure 11 (Sheet 11 of 12)

PROVISIONS – MOMENT/1000 (CONT)

CLUB INTERIOR PROVISIONS

WATER

Lbs.	Sta.	Mom/1000
8.6	237.6	2.04
7.6	219.7	1.67

ENTERTAINMENT CENTER (Sta. 226.9)

Wt.	Mom/1000
56 Provisions	12,71

PROVISIONS L.H. FWD CABINET (Sta. 219.4)

Wt	Mom/1000
14 Decanters Full	3,07

PROVISIONS L.H. AFT CABINET (Sta. 253.6)

Wt.	Mom/1000
5	1.27
10	2.54
15	3.80
20	5.07
25	6.34
30	7.61
35	8.88
40	10.14
45	11.41
50	12.68
55	13.95
60	15.22

OR

PROVISIONS L.H. AFT CABINET (Sta. 253.6)

Wt.	Mom/1000
3 Hotcup	0.70
12 Mini Rack Full	3.00
27 Storage	6.85

RH GALLEY MODULE (Sta. 241)

Wt.	Mom/1000
10 Mapco Oven	2.41
15 Mapco Thermos Full	3.65
6 Upper Storage	1.45
27 Lower Storage	6.53

OR

RH GALLEY MODULE (Sta. 241)

Wt.	Mom/1000
32 Storage	7.74
15 Mapco Thermos Full	3.65
6 Upper Storage	1.45
27 Lower Storage	6.53

Figure 11 (Sheet 12 of 12)

LANDING GEAR DIMENSION DATA

NOSE WHEEL	℄ WHEEL	MAIN WHEELS	℄ WHEEL
	Fus. Sta.		Fus. Sta.
Fully Compressed	153.88	Fully Compressed	397.00
Static	153.63	Static	396.82
Fully Extended	152.62	Fully Extended	396.04

Figure 12

WEIGHING INSTRUCTIONS

Periodic weighing may be required to keep the Basic Empty Weight current. All changes to the aircraft affecting weight and balance are the responsibility of the aircraft operator. For additional detail information relating to weighing and leveling procedures, refer to 35/36/35A/36A Maintenance Manual, Chapter 8.

1. The Basic Empty Weight is established with the wheels down.
2. Three jackpoints are provided for weighing: Two on the wing at Fuselage Station 414.85, and one on the forward fuselage at Fuselage Station 170.53.
3. Fuel should be drained through the drain valves prior to weighing and with the aircraft in level or static position. If unable to drain fuel, refer to the Unusable Fuel Table to determine weight and balance. Unusable Fuel is part of the Basic Empty Weight.
4. Hydraulic reservoir, accumulator, oxygen bottles, alcohol tank, and gear shock struts must be filled to normal operating capacities.
5. To determine aircraft configuration at time of weighing, installed equipment is checked against the Standard Equipment List and shortages or items in aircraft, but not part of Basic Empty Weight, should be noted and the final Basic Empty Weight shall be corrected for these items. All items should be in their normal place during weighing.
6. The aircraft must be in a level attitude at the time of weighing. Level is determined with a plumb bob attached to a clip on the upper aft side of frame 26A and the level plate hole on the lower portion of the frame.
7. Weighing should always be made in an enclosed area free of drafts. The scales used should be properly certified and calibrated.
8. Weighing the aircraft on wheels.
    a. Inflate the tires to the proper pressure.
    b. Deflate the shock struts. This is to establish the fuselage station of the centerline of the nose wheel axle. The fuselage station for the nose wheel axle in this condition is 153.88.
    c. Leveling is accomplished by inflating the main gear struts.
    d. Measure the perpendicular distance between the nose and main gear axle center lines (approximately 243.2 inches) if shock struts are inflated. Add this measurement to the nose gear axle position (Fuselage Station 153.88) to obtain the main gear fuselage station.
    e. Substitute the nose and main gear stations for the jackpoint stations on the Aircraft Weighing Record and proceed as in jackpoint weighing.

UNUSABLE AND TRAPPED FUEL AND OIL

ITEM	GALLONS	WEIGHT (6.7#/Gal. Fuel) (7.5#/Gal. Oil)	MOMENT/ 1000
Trapped Fuel	2.58	17.3	6.37
Drainable Sump	4.94	33.1	12.19
Unusable In Flight	12.90	86.4	31.81
Total Fuel Included in Empty Weight	(20.42)	(136.8)	(50.37)
Trapped Oil	2.4	18.0	8.04
Drainable Oil	2.9	21.0	9.52
Total Oil Weight	(5.3)	(39.8)	(17.56)

Figure 13

AIRCRAFT WEIGHING RECORD

Date Weighed
Model 35A/36A
Serial No
Place Weighed
Weighing Inspector

Reaction	Scale Reading	Tare	Net Weight	Arm	Moment
Left Jack				▨	▨
Right Jack				▨	▨
Sub Total				414.85	
Nose Jack				170.53	
Total (As Weighed)					
Total Items Table I			-		
Total Items Table II			+		
Basic Airplane					

TABLE I

Items weighed but not part of basic airplane	Weight	Arm	Moment
jack pads			
TOTAL			

TABLE II

Basic items not in when weighed	Weight	Arm	Moment
unusable fuel			
TOTAL			

Figure 14